Targeted Audience Messaging Within the Wildland-Urban Interface

A Report to the Southern Wildland Urban Interface Council

12/31/2013

Green Infrastructure Center

Published by the Green Infrastructure Center and the Southern Wildland Urban Interface Council. Please note that this is an independent report and does not necessarily represent the views of the USFS.

Special thanks to Charles Kline and Kate Bird for publications research and interviews. Karen Firehock authored the report. Editorial assistance by Tim Lewis.

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December 2013

Front cover is the Cherokee National Forest in Tennessee

Executive Summary

Forest resource managers in the wildland urban interface (WUI) of the southern United States face a particularly challenging task: How do we communicate effectively to people who are non-traditional stakeholders about forest fire safety and forest management practices and threats? Stakeholders may be 'non-traditional' because they have moved into a once rural or wildland area and are not familiar with forest management needs. This is a particular challenge in areas where sprawl-patterned development is bringing more people into previously rural landscapes. As more people move into these landscapes, the risk increases for loss of life and property, as does ecosystem impacts.

This report summarizes research on existing messages that are relevant to members of the public who live or work within the WUI. It was written for the Southern Wildland Urban Interface Council (SWUIC) to inform its efforts to recommend how forest agencies can communicate effectively with stakeholders about the risks and challenges of development within the WUI. The focal areas of the project are fire management; forest health (pests and pathogens); and land conversion impacts (forest fragmentation, water supply and water quality).

The results of this research can be used to inform message content development and to implement strategies across the USFS's Southern Region. It is a first step toward capturing what is working well and to create a platform upon which to build in the future, in order to ensure safe communities and healthy forests.

Research was conducted through a literature review, interviews and focus groups. A key finding from those interviews and research is that, while many messages have been created, there is not a great deal of measurement for message effectiveness. In most cases, little is known about the changes that occur as a result of messaging around the issues studied for this report. While one study in Florida linked expenditure on wildfire messaging to effective action based on reduced wildfires, the authors cautioned that the results were only relevant to Florida and would not necessarily translate to all communities (Prestemon *et al* 2010). A great deal more research is needed to determine whether messages are having the intended effects on stakeholders' comprehension of key forest issues and, just as importantly, on behavioral change.

Most forest health and safety messages to date have been developed for wildland fire safety, followed by forest pests and pathogens. There is not a great deal of messaging from forestry agencies concerning land conversion impacts (impacts of changes in land cover from forest to urban). Messages about the amount of forest lost were often presented by forest advocacy groups or state forestry commissions rather than the agencies themselves.

There were not many messages about the cause of conflicts within the WUI. While sprawl-patterned development and encroachment of new subdivisions were mentioned, the cause of that sprawl, such as inadequate zoning, lack of risk awareness by public officials, building in fire-prone areas -- was often not addressed in message development. The GIC tested some of these concepts about land conversion through its focus groups.

This report examines the challenges of WUI messaging and recommends these next steps for research and action:

- Evaluate ***message effectiveness***, both pre-release and post-release.
- Ensure that campaigns contain ***locally relevant materials*** and information, whenever possible.
- Expand capacity to ***reach non-traditional stakeholders***.
- Develop more messages about the importance of the ***forest economy*** (to highlight the value of forests).
- Develop new messages about the causes and impacts of ***land conversion*** on water, fire risk and wildlife habitat.
- Develop messages targeted to ***actions that citizens, planners and developers*** can take to prevent land conversion (beyond fire safety).

Contents

Introduction

Communicating effectively about forest fire safety and forest management practices to stakeholders is a challenge for forest resource managers, particularly in the wildland urban interface (WUI) of the Southern US where sprawl-patterned development is bringing more people into previously rural landscapes. As more people move into these landscapes, the risk of loss of life and property increase, as does the impact on forest ecosystems.

In the spring of 2011, the US Forest Service (USFS) summarized a number of key forest issues that had been identified by the 15 states and territories in its Southern Region. Its report, *Planning for the Future of Southern Forests, Summary Document: 2010 Statewide Forest Resource Assessments and Strategies,* highlighted the significance placed by Southern states on outreach to landowners, local governments and community organizations. These states recognized the importance of public perceptions on their ability to manage forest lands, as well as on the value placed on forest resource conservation.

About This Project

This report was compiled by the Green Infrastructure Center (GIC), based in Charlottesville, Virginia. It was undertaken on behalf of the Southern Wildland Urban Interface Council (SWUIC), of which GIC is a member, as the first step in an effort to highlight what messages are needed to communicate with stakeholders about the risks and challenges of development within the WUI in the Southern Region of the USFS. The SWUIC selected three key issues to focus on: fire management; forest health (pests and pathogens); and land conversion impacts (forest fragmentation, water supply and water quality). These issues were identified by staff within the SWUIC in a *Request for Proposals*.

The goal of the project was to increase the positive impact of messaging. It identified key public messages, the utility of those messages and those current best practices used to communicate them to the public. It also asked respondents in state forestry agencies how they currently develop their messaging and what messages they have found to be the most helpful. Respondents were also asked how they tailored their messaging to specific target audiences and what challenges they had come across along with lessons they had learned from communicating with stakeholders.

The results of this research can be used to inform message content development and implement strategies across the USFS's Southern Region. It is a first step to capture what is working well and to create a platform to build upon in the future, in order to ensure safe communities and healthy forests.

Methodology

Compiling this report involved a four-fold process, in which a wide variety of experts and stakeholders were contacted and a literature review was conducted:

- Identifying key target audiences and topics.
- Compiling a literature review.
- Conducting interviews.
- Holding a series of four focus groups.

Key Target Audiences and Issues

The first step in this project was to identify key target audiences and issues. This was done by staff of the Southern Region of the USFS. They based their key target audiences upon those stakeholder groups for whom effective

message communication would have the largest possible impact on forest resource management. They included those sectors of the public with the greatest potential to impact forest health and community safety, either positively or negatively. They were identified as: those who manage private forests; forest landowners within the WUI; other WUI residents; *FireWise* coordinators; and those who make decisions about land planning and development.

A proposed list of stakeholders was then compiled by the GIC and submitted to the USFS's Southern Region staff for comment and approval. A lit of key issues were also compiled in consultation between the GIC and Southern Region staff.

Literature Review

Next, a limited literature review of key messages and communication strategies was conducted. The review focused on resources related to the broad themes identified by the US Forest Service, including fire management, forest health and land conversion impacts; best practices in message development; messaging efforts within the USFS Southern Region; and communication strategies. The review included scholarly works and journal articles; state and federal program resources, including communication strategies and outreach materials; plus industry publications. The subject areas were diverse and included such sources as social science, environmental psychology, forest management and communications literature. (See Appendix A for the literature reviewed.)

Interviews

The GIC then conducted a series of interviews to identify best practices and lessons learned in message development and communication. These were held with those state forestry agency staff and SWUIC members involved in public communication, resource management and messaging who responded to interview requests concerning best practices and lessons learned. They were conducted in July and August 2012. (See Appendix C for interview questions, interviewees and a summary of responses.)

Focus Groups

Finally, four stakeholder focus groups were conducted by the GIC during the spring of 2013 on messaging about the Wildland Urban Interface (WUI). These were held in Tampa, Florida; Asheville, North Carolina; Austin, Texas; and Charlottesville, Virginia.[1] They covered existing fire management, forest health (pests and pathogens) and land conversion impacts (forest fragmentation, water supply and water quality). The focus group sessions also investigated general attitudes about forest management and related terminology. Messages were presented using a variety of media, including written, visual (video and slideshow) and oral (facilitated discussion) formats. A diversity of stakeholders were invited to attend. They included rural and forest landowners, elected and appointed officials, forest managers, and neighborhood or homeowners' association representatives. (See Appendix B for key findings from those discussions.)

[1] *While it would have been valuable to hold focus groups in every state in the Southern Region, the budget was not large enough to support this. The four states were selected by the Southern Region of the USFS staff to represent a diversity of conditions.*

Chapter 1: Target Audiences and Key Issues

In collaboration with the Southern Region of the US Forest Service (USFS), the Green Infrastructure Center (GIC) of Charlottesville, Virginia, identified forest landowners and local governments as the key target audiences for whom WUI messaging development and communication would have the greatest impact. It was hoped to increase their awareness of forest issues, affect key behavior changes, and advance natural resource management efforts in the WUI.

Addressing forest management issues requires effective communication with the public about human influences on the natural systems in which they live, the actions they can take to mitigate those impacts, and the measures they can implement themselves to reduce safety risks from wildfire.

Key Target Audiences

Eighty-seven percent of forested land in the Southern Region is privately owned (Smith et al 2009). As a result, it is critical to ensure sound management of those private forests and give private landowners a better understanding of how to avoid negative impacts of their action on state and federal forest lands, in order to achieve both a healthy forest ecosystem and a sustainable forest industry.

Landowners

Of the 87 percent of privately held forest lands in the Southern Region, 70 percent are held by families and individuals – a percentage that is growing (Smith et al 2009). Rapid population growth and expansion of residential land uses in the fringe of urban areas of the south has put more landowners than ever within the WUI. These changes suggest that the messaging needs of landowners within WUI areas may also be changing. Because of this, communicating effectively with these private property owners is essential to advance fire prevention efforts and achieve community buy-in for natural resource management initiatives. However a study of 4 million southern family forest owners showed only 120,000 had forest management plans in place (Butler 2008).

Businesses

Targeted businesses in the WUI included those involved in forestry operations. Messaging is important to increase their awareness of forest issues and effect behavior changes that will advance natural resource efforts. Negative perceptions of forest harvesting or forest management techniques, such as thinning, removal of invasive flora or prescribed fire can make it more difficult for forest-dependent businesses to thrive, so they have an interest in providing the wider public with better information on healthy forestry practices.

Local Governments

Collaboration with local governments is a vital component of effective communication of forest management issues in the WUI. Local governments can be key partners in disseminating important messages, especially when resource constraints limit the communication efforts that can be undertaken by state agencies. Local government partners can help those agencies reach larger audiences, and often they have the trust of their communities, which is a key to increasing stakeholder buy-in. Local governments also make key decisions every day that affect the current and future conditions and use of the landscape. Most land-use decisions in the United States are made at the local level and there is growing recognition of the enormously aggregated ecological consequences of local land-use decisions. According to *Planning for the Future of Southern Forests, Summary Document: 2010 Statewide Forest Resource Assessments and Strategies* (the *'Summary Document'*), local governments can implement important policy changes to discourage forest fragmentation, minimize barriers to prescribed burning and encourage good land management practices.

Table 1.1: *Planning for the Future of Southern Forests, Summary Issues*

Trends Affecting Southern Forests* Major topics identified by all southern states include:

Urbanization and urban forest management – Population growth and urbanization present challenges to maintaining healthy, productive and resilient forests, while at the same time increasing the demand for forest ecosystem services, such as clean air and water.

Working rural forest landscapes – While 87 percent of forest land in the South is privately owned, changing markets and ownership patterns create new challenges. Maintaining the economic, environmental and social benefits provided by forest lands is a priority across the region.

Forest ecosystem restoration – Restoration of specific ecosystems (such as longleaf pine, shortleaf pine, American chestnut and the "Cross Timbers") helps maintain or enhance the health and resilience of forest landscapes and to provide ample wildlife habitat.

Forest pests – Insects, disease and invasive plants threaten the health and productivity of Southern forests, particularly when the balance between host and pest is upset.

Wildland fire – Alteration of natural fire regimes and associated ecosystems, exacerbated by the increasing wildland-urban interface, has contributed to increased loss from wildfire in recent years. States are faced with increasing fire management needs alongside often insufficient resources.

Extreme weather events – Storms, floods and drought impact forest ecosystems and cause economic and cultural losses. Hurricanes, ice storms and tornadoes are of particular concern in the South.

Ecosystem services maintained by forests – Healthy, resilient forests and trees filter our water, reduce air pollution, help cities and towns conserve energy, and contribute to biodiversity. States are concerned about multiple factors that threaten the ability of their forests to continue to provide these services.

Local economic and social benefits of forestry – The forest industry is vital to the South, which produces over half of the United State's timber products on just under a third of the nation's forested land.

Climate change – Climate change is expected to increase stress on forest ecosystems due to storms, drought, pests, fire and sea-level rise. Land management can mitigate the effects of climate change by making forests more resilient to stress.

Issues[2]

For this project, the USFS Southern Region staff identified three primary focal areas for stakeholder message research in the wildland urban interface:

- Fire safety

[2] These issues are taken from the 2010 report, "*Planning for the Future of Southern Forests, Summary Document: 2010 Statewide Forest Resource Assessments and Strategies"* which summarized statewide forest resource assessments and identified issues of importance across the 13 states, plus Puerto Rico, comprising the Southern Region of the USFS.

- Forest health
- Land conversion impacts

Fire

For fire safety, four general themes of concern were identified by the USFS's *Summary Document*:

- Barriers to prescribed burning
- Fire-dependent forests in the South
- Alteration of natural fire regimes, which contributes to wildfires
- The increased complexity of fire management

Fire management (fire safety and controlled burns)

The majority of the literature related to WUI issues focuses on prescribed fire and fire management. As people continue to move into rural areas that are in close proximity to managed forests, management methods, such as prescribed burns, have increasingly come under scrutiny. Furthermore, residential impacts on fire risk have become much greater. As a result, effective messaging to residents and local governments about fire management is critical to ensure that effective forest management can occur. It is also important that landowners follow sound fire safety practices to avoid risks from wildfires.

Issues of concern relative to fire management include urbanization, forest fragmentation, pests, non-native invasive species, the effect of weather events on forest health, climate change, and the conservation and restoration of forest ecosystems.

Forest Health: Pests

Similar to concerns raised with fire management, landowner management of adjacent and nearby lands can impact forest health. Landowners can inadvertently introduce invasive, non-native plants and forest pests and pathogens into the WUI area because they do not understand the problems and risks.

Forests in the South are under threat from a number of non-native invasive species, such as the hemlock wooly adelgid (*Adelges tsugae*), the emerald ash borer (*Agrilus planipennis*) and the Asian longhorned beetle (*Anoplophora glabripennis*). While ash borers are susceptible to extreme cold and predators such as woodpeckers, they are establishing a foothold in the South. The Asian longhorned beetle arrived in solid wood packing material and focused attention on this previously loosely regulated pathway. In all, it is estimated that 360 non-native insects have now become established in American forests (Liebhold *et al* 1995).

National losses in traditional forest timber production due to non-native insects and pathogens have been estimated at $4.2 billion per year (Pimentel, *et al,* 2000). The public can play a role by alerting authorities to new infestations and by not behaving in ways that spread infestation, such as moving infected firewood into uninfected forests.

A 2006 national survey of 817 voters showed relatively low levels of awareness about forest pests and pathogens (Fairbank *et al* 2010). However there was greater awareness of particular infestations. States affected by the Asian long horned beetle had a 54 percent awareness level of this insect; for states infected by the emerald ash borer, awareness of the threat was 43 percent. Concern about forest pests was found to be greatest in the Northeast.

Forest Land Conversion: Effects on Water Quality

There are a multitude of issues raised in the USFS's *Summary Report* on state forest resources (see text box). These included the impact on water quality of urbanization and urban forest management, and the important role played by forests in managing stormwater.

However, there are also other areas of concern for southern forests. In particular, there are three issues not specifically addressed in detail in the *Planning for the Future of Southern Forests* report, that could be important message topics for WUI stakeholders.

These are:

- The role of forested riparian buffers in preserving water quality.
- The role of forests in facilitating groundwater recharge.
- The importance of maintaining the forest canopy and minimizing impervious surfaces in an urbanizing environment.

Desired Behavior Changes and Outcomes

The identification of key behavior changes desired as a result of communication efforts is a key step in targeting the development of effective messages and communication strategies. The GIC reviewed a variety of literature to identify desired behavior changes related to fire management, forest health and sustainability, and water. For issues where specific targeted behavior changes were not explicitly stated in the materials reviewed, we inferred them based on information gleaned from resources and interviews. These behavior changes are listed by area of interest and specific issue in Table 1.2. For sources where the term 'Future' is indicated, this is a recommendation for future study to be conducted as there was no successful project identified or materials identified were very limited in scope and extent.

Table 1.2: Key behavior changes by area of interest and issue.

Area of Interest	Issue	Key Behavior Change	Target Audience	Source
Fire management	A. Barriers to prescribed burning	Increase understanding of the difference between prescribed fire and wildfire.	Landowners and local governments	*One Message, Many Voices Campaign Video*
		Increase community acceptance of prescribed fire impacts and the positive benefits of managed fire.	Landowners, businesses, local governments	Wildfire Risk Reduction in Florida
	B. Fire-dependent forests	Reduce house damage and loss from wildfire in (location) over the next five years.	Landowners, local governments	Wildfire Risk Reduction in Florida
		Increase understanding of fire-dependent forest systems.	Landowners, local governments	*Future*
		Increase public acceptance that forests change their structure and species over time.	Landowners	State of Texas Recommendation: Interview
		Increase awareness of wildfire risk.	Landowners, businesses, local governments	Wildfire Risk Reduction in Florida and Ready Set Go Campaign

Area of Interest	Issue	Key Behavior Change	Target Audience	Source
		Increase knowledge about steps landowners can take to reduce risk.	Landowners	Wildfire Risk Reduction in Florida, Ready Set Go Campaign
		Increase landowner participation in creating (desired actions) in (location).	Landowners	Wildfire Risk Reduction in Florida, Ready, Set, Go Campaign
	C. Alteration of natural fire regimes	Increase understanding of the alteration of natural fire regimes and its role in current fire events.	Landowners, businesses, local governments	One Message Many Voices Campaign
	D. Increasing complexity in fire management	Collaborate effectively with other local governments and state and local partners.	Local governments	*Future*
Forest health	A. Forest fragmentation	Create disincentives for poor land management practices.	Local governments	*Cerretani* May 2011
		Revise tax policies to discourage the fragmentation of forests.	Local governments	*Cerretani* May 2011
		Adopt tree ordinances and other "tree-friendly" legislation or policies.	Local governments	*Cerretani* May 2011
	B. Forest pests	Prevent transportation of infested firewood into uninfected forests.	Landowners, businesses, local governments	*Don't Move Firewood* Campaign
	C. Non-native invasive species	Increase awareness of the threat posed by non-native invasive species to forest health.	Landowners, businesses, local governments	*Randall* et al 2006
		Implement policies to encourage the management of non-native invasive species on public and private land.	Local governments	*Future*
Land Conversion	A. Forest fragmentation	Create disincentives for poor land management practices.	Local governments	*Cerretani* May 2011 World Resources Institute

Area of Interest	Issue	Key Behavior Change	Target Audience	Source
		Create awareness of the need to avoid over development of wildland forest areas.	Local governments	*Future*
	C. Riparian buffers	Create incentives for the installation and maintenance of riparian buffers.	Local governments	State forest buffer programs
		Increase awareness of the importance of riparian buffers.	Landowners, businesses, local governments	State forest buffer programs
		Increase the implementation and maintenance of riparian buffers by private land owners.	Landowners, businesses	State Forest Agencies
	D. Groundwater recharge	Implement policies to protect groundwater recharge areas.	Local government	*Future*
		Implement land uses compatible with the preservation of groundwater recharge areas.	Landowners, businesses	*Future*
		Increase awareness of the importance of groundwater recharge.	Landowners, businesses, local government	*Future*

Chapter 2: Key Messaging Formats

This chapter focuses on media formats and the content strategy for key messages. How messages are constructed and the ways in which they are delivered are critical to ensuring the message communicates the intended content effectively and to ensuring it achieves the desired outcome. A key message is developed intentionally. It is not something one derives from reading a long text but rather can stand on its own. The first section of this chapter focuses on communication media types followed by the structure of key message development.

Communication Media

Strategies for communicating messages to WUI stakeholders range from traditional media such as newspapers to comprehensive online social media campaigns. Not all communication methods are suitable for all target audiences. For example, interviewees noted that residents of remote areas in the WUI might not have access to traditional communication channels. In addition, some message formats may be more or less appropriate depending on socio-demographic factors such as age, education level, and income. This can affect people's acceptance or utilization of various media. Examples of communication methods are listed in Table 2.1. Communication resources staff agree that the key to an effective outreach campaign is the use of mixed types of media and multiple sources in messaging efforts (Jakes April/May 2007).

Table 2.1: Communication Media*

Type of program	Examples of media
Mass media	Press releases, public service announcements, press conferences, reporter tours, billboards.
Public outreach	Educational materials, direct mail or telephone, newsletters, formal meetings, utility bill inserts.
Electronic media	Website, web-based "news" feature or weblog, social networking (e.g., Facebook, Twitter), electronic newsletter or listserv.
Exhibits and displays	Exhibits at festival or community events, museum displays, subdivision displays (clubhouse, entry gate), retailer displays.
Community events	Programs, field days, tours, classes, service group or church presentations, community work days.

* *Adapted from Wildfire Risk Reduction in Florida, 2010*

Communication resources and interviewees identified a number of best practices in communication efforts (for more see Appendixes):

- Be consistent in communication and repeat messages frequently. Explain any changes in information clearly to avoid confusion (Jakes April/May 2007).
- Use effective and attractive graphics to support messages (Jakes April/May 2007). For example, audiences respond to images of green-up after fires (Hibbard *et al,*. 2009)
- Provide references and informational links (Jakes April/May 2007).

- Take advantage of communication opportunities. During bad fire seasons, for example, WUI audiences are paying attention to communications, so when communicating about fire, also consider inclusion of forest management messages (Jakes April/May 2007).

Trusted Local Sources

In the focus groups conducted by the GIC, government sources were generally a trusted source of information. Half of the participants preferred either the Internet, small group, or one-on-one conversations, or preferred to read brochures or reports, rather than other choices, such as social media or television. Approximately 80 percent preferred to get their information from woodland professionals, such as county foresters or companies. Films, videos and newsletters were ranked lower: either as 'somewhat preferred' or as 'not preferred.' Almost none of the respondents preferred billboards as a way of receiving information.

As for the most trusted sources of information, about 94 percent of focus group respondents chose experts (foresters or field scientists), followed by personal searches on the Internet (61 percent) and then reports (53 percent). The findings are similar to studies conducted for the Northeastern Association of State Foresters (NAASF), in which respondents ranked local government as the most trusted source of information, followed by USFS foresters and then state forest management agencies. Other sources including television and print media are considered less credible (Responsive Management 2011).

Efforts by state and federal program managers to communicate one-on-one with local government representatives can multiply the impact of agency outreach efforts. Local government partners can extend the reach of communication efforts into their communities, helping state and federal agencies reach larger audiences. This helps to increase stakeholder buy-in, as the stakeholders are communicating with a trusted source, and helps to maximize agency resources (Responsive Management 2011).

The Texas Forest Service has found outreach to local governments to be its most effective communication method. The agency recently ran a pilot program to provide a train the trainers event for the *Ready, Set, Go!* program to prepare landowners to prepare for fire emergencies. Texas is now leading the country in the number of participants in this program.

Traditional Media

The NAASF study found that "older people and more educated people… are the most likely to use print media" (Responsive Management 2011). Among traditional media, the study found that respondents relied on traditional print media types (television, newspaper, and magazines) at approximately equal rates (24 percent, 23 percent, and 21 percent respectively). In interviews, state forest program managers also pointed out that traditional media strategies as well as radio PSAs could be more effective in reaching audiences in remote areas. PSAs are currently a key component of the Florida Forest Service's outreach efforts.

Managing message dissemination through traditional media should be handled carefully, especially regarding topics such as prescribed fire, as the media plays a part in shaping the public's perception of issues and can distort reports and create controversy (Jacobson *et al* 2001). It is critical to ensure that comprehensive information is provided to media outlets and that they understand the messages being communicated to them (Hibbard 2009).

Electronic and Social Media

Electronic media include websites, email campaigns, blogs and social media (*e.g.*, Twitter and Facebook). While these outreach strategies can be a valuable tool in a communication campaign and are helpful in effectively conveying timely information, interviewees noted that older stakeholders can be reticent to adopt them (Appendix B).

Agency experience in social media varies. In Florida, foresters use twitter to communicate with stakeholders about fire events in real time. They have found success in pairing preventative messaging with this real-time information, taking advantage of the attention and interest in their tweets(See Appendix B). In Texas, staff in the field are not authorized to use social media, but relay information to communication specialists for posting. The TFS leverages the twitter followership of local agencies, providing information to and linking to those entities to help get its message out, as stakeholders might not be as familiar with the state program (See Appendix B).

The *Don't Move Firewood* campaign has a comprehensive social media component including a presence on Twitter, Facebook, and YouTube (See http://www.dontmovefirewood.org/). This campaign includes several Facebook games, including Shred A Pest, in which players shred forest pests (http://www.carousel30.com/experience/case-studies/shred-pest-flash-game.)

Websites

The Texas Forest Service recognizes that its main agency site might not be the simplest site to navigate, or the obvious place for stakeholders to go for timely information. In response, the agency has established a series of topic-specific websites to help bring WUI stakeholders directly to the areas of interest. These include http://www.texasfirewise.org and http://www.texaswildfirerisk.com/, which provide information to homeowners on their personal risk of wildfire and steps to address it, including includes tools for developing community plans and other resources. In addition, the TFS has a web area for community leaders, with information on available tools to prepare for and prevent wildfire.

TFS recently launched a new fire preparedness website in collaboration with Code for America and the City of Austin (See http://www.prepared.ly/). This innovative tool marries social media effectively and provides real-time risk data to users. The site:

- Pulls data from the Texas Wildfire Risk Assessment in an interactive map on which users can zoom in on their home.
- Provides information on burn bans and red flag warnings in the interactive map.
- Includes a tool for users to track their completion of fire prevention tasks with email and text reminders as well as opportunities to comment on tasks and share tips with others.
- Allows homeowners to easily contact the Austin Fire Department to request additional information or ask for an assessment of their home or community.

According to the site developer's summary, this tool seems to incorporate many of the key communication strategies outlined in other resources:

> *[O]ur team decided that fire safety information needed to reach citizens in a more accessible fashion: one without pictures of distressed people in front of blazing fires, or multi-page checklists via PDF starting out with retro-fitting your house. In short, we needed to create a good interaction, where the city government enables and facilitates better life choices by giving residents the information they need in an easy-to-understand manner so they can be better prepared for emergencies*
>
> http://codeforamerica.org/2012/07/19/staying-prepared-with-prepared-ly/

Key Message Development

During the project, the GIC researched a wide variety of scholarly resources, state agency communication strategies, and industry sources, all of which provided insights into the development of effective messages for communication with stakeholders.

The focus of this report has been to identify the existing 'key messages' to relay to the public about fire management, forest health and land conversion impacts. But what is a 'key message,' and why is this approach valuable? This section of the report addresses the central concepts of key messaging, in order to demonstrate its uses and value.

Courtright and Smuddes' (2010) definition for key messages is a communication tool comprised of "two basic things." The first is "a theme, thesis or slogan that is the single idea around which all communications revolve;" the second are "copy points that serve as the basic proof or substance for detailed arguments that support the theme/thesis/slogan."

Message development is the process of providing a series of key messages that develop along a prescribed theme and have an integrated conceptual approach. In other words, what is the central concept behind your messaging? What are the themes? How will they be developed over an entire messaging campaign?

Message *practitioners* are those who deliver the campaign to the message *receivers*. Message receivers have specific needs that messages should address. Identifying those needs is essential before any messaging themes can be established. For example, are the present needs of the target audiences personal safety? Healthy forests where they can see a variety of birds and wildlife when they recreate? Or to alleviate fear about wildfires burning their property?

Audience Needs

Audience needs will often be dissimilar in different areas of the country. They may also be undeveloped: *i.e.* the audience will not be sufficiently aware of their needs, nor understand them, or they may be unarticulated. For example, an area that suffered from a recent fire will have greater awareness of the need for fire safety and thus be more receptive to messages about what to do. So it is important in messaging to articulate the need for the message. People must first be unaware of the dangers of fire to their personal safety, or else they will not respond to messages about how to avoid or prepare for it.

Inducing a Sense of Urgency

Effective messages need to instill a sense of urgency in the receiver. Message recipients need to understand why they should be concerned before they are motivated to act. As long as they persist within a way of life that has no idea about the dangers of forest fires or of how pests will devastate their localities, they won't feel the need to listen. Showing people the reality of their situation within the WUI is a central part of the role of forest messaging. In some of the focus groups held by GIC, respondents asked for more data about forest pests, noting 'Is this really a problem? We need statistics about the amount of damage, e.g. acres lost per year' (See Appendix B).

Research

Continual feedback research must always underpin message development. It allows fine tuning of a message strategy. Staff should review current messages and determine if they need more of this type of message and less of that type of message. While several respondents to interviews conducted by GIC noted that research on effectiveness costs money and was thus not conducted, it may be more cost effective to avoid spending time and effort on ineffective messages in the first place. Instead, place effort on messages that have proven effective in generating both awareness and desired actions.

The Key Message Environment

Key messages never exist in a vacuum; rather, they are within a "key message environment." Usually, this environment is a cluttered field full of many other messages that draw people's attention. "All data suggest that award-winning practitioners work with the understanding that many messages from multiple sources are competing for attention" (James 2012). Within such an environment, it is essential to be "innovative and creative" and discover what will make your particular message "stand out from the crowd – to find a 'concept' that will 'cut through the clutter'." The questions to ask here are, "How do we make our message new?" and, "How do we make it

interesting?" (James 2012). For example, to make their messages relevant to urban areas, Texas focused its messaging on how important urban forests were to attract residents – and thus more tax dollars and local spending – with local officials.

Understand Message Delivery

A further point to understand is the role of message dissemination channels. These are called *message deliverers* and include TV stations, newspapers, and the forest service itself. Message deliverers want your materials to be as valuable to them as possible – to build their audiences and interest in their media outlets. "This relates to both research for message development and tailoring the message themes" (James 2012).

In the case of the forest service, message deliverers vary from front line field staff to trained communication professionals. Messages are delivered in various formats from signs and posters, public service announcements, billboards, campsite message boards, brochures or events such as staff-run lectures, workshops etc. Coordinating the messages that each of these deliverers presents and giving them consistent, credible materials that address the messages intended for target audiences' needs are also important to messaging success.

There are also secondary sources of information such as local businesses – camping supply stores, tourist attractions, outfitters selling boating or hunting equipment, and so on, especially if they are close to the forest and are selling to people who will be immediately entering or leaving it. Third, is local media, such as newspapers, radio stations and TV stations.

Knowing the channels of dissemination well is a prerequisite to designing and packaging messages to best meet the needs of the target audience. The hope is that the message disseminators will further disseminate or "amplify" the intended key messages. Do they want a press pack? Hard copy materials, or digitized materials? Do they want interviews, or a news story? Providing message recipients with what they want in the preferred formats will help spread the message.

In the focus groups conducted by GIC, there were clear patterns in how participants preferred to receive information. Half of them preferred either the internet, small group, or one-on-one conversations, or preferred to read brochures or reports, rather that other choices, such as social media or television. Approximately 80 percent preferred to get their information from woodland professionals by word of mouth, such as county foresters or companies. Films, videos and newsletters were ranked lower: either as 'somewhat preferred' or as 'not preferred.' Almost none of the respondents preferred billboards as a way of receiving information.

Identify the style and tone of a particular media outlet and provide it with localized stories that fit in with their approach. This will maximize the chance of your key messages being incorporated into media content. For example, a TV station may greatly prefer a message delivered in terms of a personal story, perhaps about a family that recently suffered from a forest fire, or a story about a forest expert taking a class of school children into the forest to learn about the wooly adelgid. TV loves images. Radio and TV seek debate, controversy, news. Newspapers like photo-opportunities. Turning a message into a news item, helps it be picked up far more readily.

Message Repetition

Repetition of messages is central to success. This can be in many different formats and utilize many different outlets. Professional messengers talk of "getting it into their heads" and "ramming it home." Moloney states that "You've only got an opportunity to get a few points across, so ram home your messages and a couple of facts to support them" and "attitudes and behaviors only change after many rounds of messaging" (2006).

Tailoring Messages for Different Target Audiences

Messages must be tailored for specific targeted publics. The public is not a uniform entity so there needs to multiple target audiences for which unique messages are needed along with multiple messaging strategies. People exist within their own frames of reference, and it is important to identify where they are coming from and what they consider to be important – not only what a forestry agency considers to be important. Several specific examples of how to tailor a message to a particular audience were revealed during our research. For example, the Georgia Forest Service emphasizes the empowerment of homeowners and local groups in its messaging (See www.galegacy.org/forests).

Also in Texas, many business owners are property owners as well, and the Texas Forest Service (TFS) uses the same messaging for this stakeholder group as it does for homeowners. For example, an industrial park in Austin has needs similar to those of a community or a high-rise apartment and the fundamental messages are the same.

When it comes to local governments, the TFS develops messaging that focuses on the empowerment of local communities and community fire preparedness. The agency's primary message is that local governments should use the TFS as a clearing house to learn about available resources.

Credibility

Credibility is vital to a successful messaging campaign. If the dangers about which people are being warned do not seem credible, then people will dismiss claims and messengers will find it even harder to convince recipients. Messaging is basically advertising. People make judgments about advertising almost immediately: Is this relevant to me? Do I care? Are they trying to use scare tactics? For example, some of the focus group respondents told GIC staff that they objected to the use of the word 'Armageddon' in describing fire conditions in the *Ready, Set, Go* video materials because of its biblical connotation, which may be unfamiliar to some people. They also perceived it as a scare tactic that they found distasteful.

These are all ways in which people turn off from your message and ignore it. They have to judge it to be a fair and true statement that addresses their perceived needs and fits into their frame of reference and then they might accept it. Especially if it is repeated frequently and in different way, and especially if it is delivered by people who are viewed as credible.

Credibility requires consistency of message – an historic problem for the forest service. For example, Smokey Bear used to warn people that, "Only You Can Prevent Forest Fires!" But the fact that the forest service was conducting prescribed burns greatly confused people who had been led to believe that *all* fires were harmful. Later, the forest service changed its message to, "Only You Can Prevent Wildfires!" but people remained confused about the difference between what was a wild fire and what was not.

This brings up the importance of having an effective spokesperson to deliver key messages. They must be delivered, articulated and attributed by a consistent spokesperson (it could be a cartoon character, such as Smokey Bear), in which people have trust and confidence. This is why media training and coaching in message delivery is vital. And so is consistency of message. Keeping it simple and consistent greatly aids message reception. So is teaching people to stay on message, to project enthusiasm and be able to adapt the same message to different audiences. Holding regular meetings between all message deliverers can ensure that key messages are carefully refined and agreed to by all parties involved in the messaging. It can also help messengers become aware of counter arguments that people are raising to agency messaging.

Credibility can be severely dented by being untruthful. But providing 'facts' and 'figures' or examples that don't seem to relate to a particular region or locality can be just as harmful in destroying credibility. For example, it might seem to be a money-saving strategy to use videos that relate to all areas of the Southern Region, but when people in Florida watch firefighting in Texas and are given figures that relate to property damage in Tennessee, they will find it hard to believe that those figures and images relate to them. For example, focus group respondents in Florida

commented that the 'hills' shown in the Ready, Set, Go videos were not relatable since there are no high ridgelines in Florida.

Build New Messages to Expand Current Knowledge

Whenever providing new information in a new messaging campaign, link that information to what is already understood by the intended audience. Discovering that is part of the continuing feedback research you need to do as you develop your messaging campaign.

A message is delivered. The next step is to ask people – in various ways – what they learned from it and discover what parts of your message have been assimilated and which haven't. "If you don't go back to where they were and pick them up and bring them along with you, you know, you're going to have a disconnect forever" (James 2012).

Countering Opposite Arguments

A significant part of the credibility issue is learning how to respond to naysayers and opponents of a message. All messages have people who dismiss them as untrue, scare-mongering, or belittling. Others will say that the measures proposed to solve a problem are wrong, inadequate, or bad. Listen to the naysayers. Address their concerns directly. Ensure that part of the messaging responds to, for example, those who say that there is no need to do prescribed burns. Unless this is done, unless the audiences are shown to be credible, they messages will fall on deaf ears. There are many ways to address opposition arguments: meeting with opposition spokespeople, debating with them and running counter-messaging, leading field trips to show conditions in the forest are all ways to handle this problem.

Message weariness

Message weariness is another problem. It occurs when they same message is delivered too often. The way to marry message repetition while avoiding message weariness is to continually update the message and present it in new, exciting ways. Also, taking advantage of local fire or pest events can bring a freshness and relevance to messaging.

Positive Messaging

Effective messengers should be aware of precisely what it is they want their key message to achieve: Is it to allay fears? To raise fears? To inspire action? To educate? Craft the message to achieve that aim, with ground-truthing research to ensure that the campaign is achieving what you want it to.

One problem that some forest service messages have is a perception that they are overwhelmingly negative. They repeatedly tell people *not* to do something. Not to light fires. Not to transport firewood. Other messaging is positioned as fire *prevention* rather than taking positive action.

In contrast, *Ready, Set, Go!* and *FireWise* are both positive in their approach. They raise awareness of dangers and direct people towards positive action they can take. These are likely to be more successful in motivating people to change their behavior.

The question is how to turn negative campaigns on the spread of pests and pathogens or the prevention of fires into positive approaches that encourage people to take actions to protect their forests. Part of this is to realize that key messages are most effective when they give people the power to *do something*. Key messages can dispel myths, allay concerns and instill confidence. According to one campaign manager, they were a way to "fuel a debate in the media;" in another, the key message was "designed to play on a public feeling."

Positioning

All these strategies can assist forest agencies in positioning messages positively in the minds of their intended audiences. 'Positioning' means to place the message in terms of competing messages. Usually, it applies to products such as Coca Cola, which wants to position itself in relation to other soft drinks. It is hard to know how the forest service can 'position' itself, but doing that – providing positive images of forests in terms of leisure activities, the environment, timber production, and so on, can be a powerful aspect of messaging -- showing the many irreplaceable values forest provide. "We tend to work on three key messages that are your main themes of how you want to position this initiative" (James 2012). For example, forests help to filter water. Showing how forests = clean, healthful water and not polluted water is one way to use 'positioning.' Choosing forest protection = choosing clean water and healthy families is another example of positioning.

Chapter 3: Messaging Strategies and Content

In addition to general best practices in messaging, specific message-development strategies were identified for the topics of fire management, forest health and land conversion impacts. This chapter discusses those best practices along with examples of key messages within the three topic areas.

A study conducted by Pelletier and Sharp in 2008 notes that stakeholders move through three important phases of awareness and action about a problem:

- Detection
- Decision
- Implementation

Pelletier and Sharpe recommend that different messaging strategies should be used for each of these phases (2008).

Three Phases of Message Development: Detection, Decision, Implementation

Detection Phase

At the detection phase, the researchers found that it was more effective to *emphasize the risks of failing to adopt a particular behavior* than it is to emphasize the benefits of adopting the behavior. These findings are echoed by Davis, who cites a study asserting that "messages *emphasizing losses associated with inaction* are generally more persuasive than messages emphasizing gains associated with action" (Davis 1995).

Pelletier and Sharp caution that raising awareness of a risk might prompt the audience to "use defensive avoidance if they don't have continued information," so it is important to supplement these cautionary messages with *information about steps that can be taken to avoid risk*. In other words, messages motivated by negative consequences should also be followed by positive, proactive steps that message recipients can take to avoid the risk.

Monroe and others agree, positing that the use of threats, guilt and fear can cause emotional distress and feelings of helplessness that will not advance the objectives of the message. It is important to frame the ideas of risk in a way that will *encourage action*, rather than apathy and inaction (Monroe 2006 and 2011). This finding was echoed in the focus groups conducted by GIC (see Appendix B). In response to statistics about how many net acres of forests are lost annually to land conversion, some focus group members stated that these losses were at a scale that left the average homeowner feeling they had no role in the solution. One stated that, "I feel like a victim." They asked how and whether homeowners could become empowered by this message.

Other research suggests there is a relationship between effective messaging that includes a meaningful dialogue with the public, rather than purely passive reading of posters and flyers. Foresters should look at ways in which such a dialogue can be developed. Ideas include public meetings, workshops, radio show phone-ins, interviewing members of the public, questionnaires that promote discussion and feedback, and having a public information center or interactive website. For more suggestions on engagement techniques from foresters themselves, see Appendix C. One size doesn't fit all. Dialogue and discussion, rather than didactic messaging, can be more effective.

To summarize:

- Emphasize the *risks* of failing to adopt a particular behavior.
- Emphasize *losses* associated with inaction.
- Provide *information* about proactive steps that can be taken to avoid risk.
- Listen and learn.

- Tailor your messaging to local concerns.
- Encourage *action*.

Decision-making Phase

At the next phase, decision making, audiences are receptive to information that will *help them make decisions* about the feasibility of taking steps to *reduce risks* and about their desire to *take action*.

At this step, messaging that *emphasizes benefits* rather than risks can be effective, "because these messages are now more congruent with the actions that could eliminate risk or the fear associated with a specific issue." Any information provided should also outline clear steps about how to *implement a behavior* (Pelletier *et al* 2008).

In summary, help people make decisions:

- to reduce risks.
- to take action.
- and emphasize benefits.

Implementation Phase

Finally, at the implementation phase, messages should help the audience *develop specific goals* and provide *information on the steps necessary* to achieve those goals. The researchers stress that goal-setting increases the likelihood that changes in behavior will be maintained over time.

In summary:

- Develop specific goals.
- Provide information on the steps necessary to achieve those goals.

Conclusions

It is clear that messages that are effective for an audience in a detection phase are not necessarily effective if those same people are in the implementation phase.

Accordingly, it is important to study the awareness of the target audience for each message before you begin your message development efforts. Ascertain the level of awareness of the target public and use messaging that builds upon that awareness.

Alternatively, three *types* of messages about one specific issue could be developed and communicated to different audiences, or the same audience at different stages of awareness (Pelletier*, et al,* 2008):

- The first to raise awareness of an issue.
- The second to communicate information about actions that can reduce risks.
- The third to inform an audience when, where and how specific steps can be taken.

All three types of messages should be communicated as part of a cohesive communication strategy.

As evidence of the value of this approach, respondents to the National Voters Survey were found to increase their level of "very concerned" from 41 percent to 64 percent once they were educated by the pollsters about the issue (Fairbank*, et al,* 2006). The authors of this poll suggest that public education and outreach can have a significant impact on voters' levels of concern.

Message Content for Each Phase

As a consequence of researching best messaging strategies, it was clear that, at each of the three stages in audience-awareness development, specific messaging strategies should be applied.

Detection phase

During this phase of the messaging, content needs to emphasize the risks and potential losses of failing to adopt a particular behavior, as well as provide information about steps that can be taken to avoid those risks and losses, and encourage action.

Include local detail and consider local context to increase relevance to the audience

While this project is designed to support the development of messages that will be relevant in communities across the Southern Region, it is important that they are customized at the local level to include local detail and context. This is part of the listening and learning process. General points are received much more readily when backed up with local facts that people can easily grasp. If it is their favorite campground or stretch of river that is threatened, they can relate to it more easily.

An important part of messaging is for people to take ownership of it. If they see it as an 'outsider's' concern, or think of it as something that doesn't relate to them, they won't respond. Get them excited. Get them concerned, not with figures about how many acres of forest were lost nationally, but how many were lost in their county. Provide relatable geographies. For example, in the focus groups conducted for this project, the GIC used land areas relatable to the local area when describing the amount of forest loss for Virginia "Over the past 70 years -- even with new forests being planted and old farms fields changing to tree cover -- we are losing a net average of 16,000 acres of forested land annually. That's like losing an area of 2 Charlottesvilles or half the city of Richmond!" Adding those areas helped participants understand the scale of the problem.

Customizing messages at the local scale to include important pieces of information related to the audience's community helps people connect personally with the message they are receiving. Take pictures of local beauty spots, local campsites, local stands of hemlocks devastated by the wooly adelgid. Think local when you want to act on a regional level.

Several respondents complained that videos and other messaging materials were too general and that local people could not relate to them. For example, Ready, Set, Go video materials showed forest fires sweeping across the West, when the audience lived in Florida, with different types of trees and land forms. They distrusted the message in part because it was not local.

The National Wildfire Coordinating Group proposes that fire messages should include information about the number of fires that occur in the local area every year. They suggest that foresters identify specific and recent local burning events and provide details of how many homes were destroyed and damaged. They also recommend that foresters increase their education efforts after unfortunate local events because people are much more open to receiving messages about the risks and losses caused by forest fires when such an event is in their recent memory. In addition, messages should be tailored to consider other elements of the local context, such as preferred regional architecture types, culturally-specific aspects of fire and the local management of fuels (Jakes 2007).

Construct messages to connect with the audience

Several message construction strategies can help an audience personally connect with a message and recall it later. The National Wildfire Coordinating Group suggests organizing a message to include three components: what, why, and how. These will help the audience recall the message later.

For example, it suggests that one such message could include these three elements:

- Protect your home from wildfire. (What)
- There is an XX percent greater risk of your home burning down if you don't take action. (Why)
- Use fire-resistant building materials, clear vegetation and develop an evacuation plan. (How)

They also suggest that the use of story-telling can help readers connect with the message. More than half of respondents to the National Voters Survey indicated that they were "willing" or "very willing" to take action to reduce forests pest impacts, once they had learned what actions were readily available to them. Another strategy is to use linked questions that help the reader link different ideas and build a concept of the connection between their own behavior and the issue of interest (Monroe 2011).

Use clear and simple language

WUI issues are complex and interrelated, and they must be explained clearly in order to avoid confusion. Many resources cite the importance of using layman's terms and nontechnical language rather than jargon to increase the ability of the audience to connect with the message. In addition, it is important to avoid emotionally loaded language (Monroe 2011). The GIC tested various forest terms in its focus groups (see Appendix B).

Consider the values of the audience

Several sources stress the importance of connecting messages with values "that are relevant and meaningful to the audience" (Monroe 2011). Schultz and Zelezny point out the conflict with the traditional appeal to "self-transcendent values" found in environmental messages with the common self-enhancing American values. They suggest that the most effective messages should appeal directly to these self-enhancing values. For instance, messages should stress the gains or losses directly related to the audience's own life, property values, etc. Pelletier and Sharp suggest that intrinsically framed messages (e.g., those that highlight potential gains or losses in health and well-being) are more effective than those that are extrinsically framed (e.g., those that highlight potential gain or losses in money) (Monroe February 2011).

Values vary by locale; the Texas Forest Service finds that messages that tie in the idea of personal responsibility are important. In Texas, just three percent of land is federally-owned and the public places a high personal value on private property rights. Thus, most messaging is targeted to private land owners and messages focus on their role as part of the solution (Monroe February 2011).

Decision-making and Implementation phase

During the decision-making phase, the messaging should help people make decisions about how to reduce risks and take action, and emphasize the benefits of doing so. The *Ready, Set, Go* campaign is the most developed example of this, telling homeowners exactly why they should prepare and how to do so. In the 'ready' phase, homeowners are advised to evaluate their surroundings and shown how to look for risks through text, diagrams and photos.

It is important not to assume that an audience knows what to do once it has learned the message content. Rather, they might feel overwhelmed, lost, or have conflicting opinions on what the best strategy might be. Again, it is important to listen, and tailor those actions to the specific needs and concerns of the people you wish to take the action (Jakes April/May 2007). For more helpful ideas from foresters, see Appendix C.

During the implementation phase, messages should include concrete action steps to be taken by the audience. The Ready, Set Go Program also tells homeowners how to act in the moment -- the 'set' phase -- when a nearby fire has started and evacuation is necessary, with tips such as 'shut all windows and doors, leaving them unlocked.' and 'Shut off gas at the meter.'

It is a challenge to, not only increase an audience's awareness of an issue, but motivate people to act on their new-found awareness. Research suggests that, in order to overcome an audience's psychological inertia, the most effective messages include *simple and specific* recommendations for action (Davis 1995). The *Ready, Set, Go* program materials meet this effectiveness criteria through simple, direct statements offered in a checklist format.

Chapter 4: Message Development Strategies by Topic

In addition to general message-development strategies, the literature review identified specific practices to use when addressing issues of fire management, forest health and land conversion impacts. Many of these recommendations echo the lessons learned about messaging generally, but it is important to stress the importance of some of these lessons in relation to these particular topics. For instance, a concept as complex as 'land conversion' can be most effectively communicated to audiences through its relation to specific local details such as acres of forest lost locally or impacts to drinking water quality.

Fire Management

It is critical to ensure consistency in messaging, both internally and among other organizations delivering messages to WUI stakeholders. Monroe *et al*. cite conflicts in messaging, either between state and federal forestry agencies or among other types agencies, as a challenge to messaging efforts. These conflicts reduce the likelihood that audiences will respond to or act on the messages (Monroe 2011).

Communicating Fire Risk

Home maintenance and fire safety is a particular area where conflicts can be common. For example, home owners might be encouraged to "plant trees to reduce electricity consumption, plant native species for wildlife habitat, [or] use mulch to reduce water," although these strategies might increase the fire risk (Monroe 2011). They may need more information about how to place trees and native plantings to provide environmental benefits while *also* reducing fire risk. The fact sheet *Fire in the Wildland Urban Interface: Reducing Fire Risk While Achieving Other Landscape Goals* provides tips for how to meet landscape fire safety goals while also acknowledging landowners interests in landscaping their yards, supporting wildlife and providing shade and shelter (Randall *et al* 2006).

Developing messages about fire risks to forest stakeholders is another challenge. Several researchers discuss the counterintuitive perception of risk by stakeholders, which may be either greater or less than would be expected. For example, Jacobson, et al, find that increased experience with fire can actually lead to greater tolerance of fire, although risk-perception theory would predict that such tolerance would increase the greater the distance from a risk area (Jacobson *et al* 2001). The authors suggest a range of reasons for this tolerance and the fact that those with more experience with fire would be less likely to take action to protect their homes, including "the actions are not applicable to their situation, because less-informed fear contributes to the desire to take such actions, or because experience builds a fearlessness about the risks of fire" (Jacobson *et al* 2001).

The challenge of communicating about risk can be compounded by changing circumstances: the Texas Forest Service has found that changes from wet to dry periods and the associated change in fire messaging can be very confusing to the public. In a dry year, the agency works to prevent all fires, as any fire can be catastrophic, while in a wet year the agency moves to advocating prescribed burns. Messaging must help an audience understand changing circumstances and their effect on fire management strategies.

Resources and interviewees both identified the conflict between "property owners' perceptions of risk and aesthetic sensibilities about an undisturbed, natural forest" and the aesthetics that would result from a restoration of a healthy fire regime and forest (Jacobson *et al* 2001). Messages about fire and forest health should take these concerns into consideration. For example, a national forest could decide to clear-cut an area to remove a highly invasive species such as tree of heaven (*Ailanthus altissima*) or Chinese tallow (*Sapium sebiferum*), with a proposal to replant the area with native vegetation. Landowners who did not understand this method's intent might protest the removal of their forest.

Recommended practices and strategies identified in reviewed literature include:

- Provide specific data about benefits and outcomes associated with fire. The public has a misperception about high costs associated with fire, including "high animal mortality, animal injury, and excessive habitat destruction," and may not be aware of improvements to wildlife habitat and other benefits (Jacobson *et al* 2001).
- Provide details on specific actions homeowners can take to mitigate risk to their homes and landscapes (Jacobson *et al* 2001).
- Tailor messages to local conditions, such as ecosystem structure, species composition, and climate (Monroe *et al* April/May 2003).
- Clearly explain how the audience's quality of life is affected by fire management (e.g., saving money and protecting property) (Hibbard *et al* 2009).
- Communicate messages utilizing clear and consistent language (Hibbard 2009).
- Use specific local and regional examples to illustrate the benefits of fire management (Appendix B).
- Acknowledge the impact of fire on air quality, the presence of smoke, and the effect on people with respiratory conditions (Hibbard 2009), (Jacobsen *et al* 2001).
- Messages about prescribed fire should focus on the priority "safety of the public, firefighters, and property" (Hibbard *et al* 2009).

Recommended Phrases to Use

At an April 2008 workshop convened by Partners in Fire Education (PIFE), forty fire management and communications experts discussed strategies for developing effective messages about fire management. Participants identified a number of effective words and phrases that are preferable to language more commonly used in internal communication about fire (Hibbard *et al* 2009). Table 4.1 lists those phrases concerning fire prevention messaging that were recommended and not recommended by members of the workshop.

Table 4.1: Recommended/not recommended phrases (PIFE Workshop 2000).

Recommended phrases	Not recommended phrases
– **natural areas**	– **wildland**
– **homes near natural areas**	– **ecosystem**
– **fire teams**	– **landscape**
– **controlled burns**	– **wildland-urban interface**
– **cut/remove/thin trees and brush**	– **fire managers**
– **managing natural fires where safe**	– **management teams**
	– **prescribed fire or prescribed burns**
	– **mechanical thinning**
	– **wildland fire use**
	– **appropriate management response**

Note that while the table list controlled burns as a recommended phrase, but new research has shown that "prescribed fire" is preferred over the term 'controlled burns.' For example, research by True Timbers in Florida, Georgia and South Carolina found that participants in focus groups tended to prefer the word 'prescribed' over 'controlled' fires as they doubted the ability to 'control' a fire. However, respondents in those focus groups also had

difficulty differentiating between terminology for a 'controlled' burn versus one that is 'prescribed.' This concern was also raised in GIC's focus groups. While trust levels were high amongst respondents, with 84 percent agreeing that they could trust professionals to control intentional fires and keep nearby properties safe, 16 percent were unsure that they could trust the professionals. None of the participants believed there was widespread support among the public for prescribed fire. Most (67 percent) stated that prescribed fire was somewhat supported and 33 percent did not know.

One Messages Many Voices Campaign

The One Message Many Voices Campaign provides suggested reframing from a 'fire' frame to a 'forest' framing related to the need to use fire in forest management. In messaging about fire management with burns, they recommend moving from a frame of reference of using "good fire to prevent bad fire" to "keeping forests healthy." In a healthy forest framing, messages should focus first on the benefits achieved such as healthy, beautiful forests, rather than beginning with a focus on the risks of fire (Tall Timbers Research Slide Presentation 2010).

The One Messages Many Voices Campaign also includes a web page www.visitmyforest.org with three steps to protect the forest: 1) Support Good Fires, Prevent Bad Ones, 2) Promote Conservation (showing the messages concerning not moving firewood) and 3) Leave No Trace (developed by the Center for Outdoor Ethics).

In addition, the campaign produced a video depicting the role of fire as part of a 'natural' process that is part of the ecosystem and supports watershed functions, plant diversity and wildlife. It is available on line on the Good Fires <www.goodfires.org> website, described by VisitMyForest as its 'sister website.' The Good Fires website actions focus primarily on being aware of the need for prescribed fire. The Good Fires website explains that "Our forests give us so much — clean air and water, habitat for wildlife, a place to escape and reconnect with the wonder of unspoiled nature. But forests no longer can depend on the forces of nature alone. They need our help to continue to thrive."

Examples of Fire Management Messages	Source
Don't invite wildfire home!	Florida Forest Service
There are 3 simple things people should do to increase the odds their home will survive a wildfire: Clean your roof and gutters, clean around the sides of your home, and keep the area within 30 feet of your home mowed, picked up, and watered within water management guidelines.	Florida Forest Service
Even a small fire can escape and become a wildfire, burning our beautiful forests and destroying homes. Remember, it's wildfire season in Florida. So, think before you burn.	Florida Forest Service
The safety of your home may depend on actions you take before a wildfire occurs.	Florida Forest Service, ID8
Florida's ecosystems need periodic fire. Florida's natural areas will burn in an uncontrolled wildfire or in a controlled manner using prescribed fire.	Florida Forest Service
"Prescribed fire is a safe way to apply a natural process, ensure ecosystem health, and reduce wildfire risk."	Florida Forest Service and *One Message Many Voices* campaign
Most wildfires are supported by overgrown vegetation and debris. Wildfire fuel reduction activities remove this excess vegetation and debris. It is seldom necessary to remove mature trees to protect a house from wildfire.	Florida Forest Service

Examples of Fire Management Messages	Source
Residents at high risk of wildfire – with homes located in the wildland-urban interface – should take action to protect their property from wildfire damage and should encourage their neighbors to do the same. Many urban areas are at low risk of wildfire.	Florida Forest Service
Wildfire will be less damaging and costly to society if preventive and protective actions are taken. While it is government's responsibility to provide for the protection of public health, safety, and welfare, it is everyone's responsibility to protect houses, neighborhoods, and communities from the wildfire hazard.	Florida Forest Service
[Controlled burns] protect people, property, and communities.	Hibbard and Morris 2009
[Controlled burns] safeguard the health and regeneration of natural areas.	ibid
Use [controlled burns] to clear fuel while managing safety.	ibid
[Controlled burns] protect our air and water by protecting the health of forests and natural areas.	ibid
[Controlled burns] give plants and wildlife the exposure to fire they need to survive.	ibid
What: The wildland urban interface (WUI) is the area where structures and other human development meet with undeveloped land and/or vegetative fuels. Wildland fire happens, be ready. People who live in fire-prone areas assume a certain level of risk and responsibility. People can live compatibly with fire, if aware of and prepared for local fire conditions. Why: A principal reason for the escalating cost of wildland firefighting is the growing number of homes being built in the wildland urban interface. How: Successfully mitigating the consequences of fires in the wildland urban interface requires special attention to the issues of community development, social behavior, environmental consequences, and public safety policy.	National Wildfire Coordinating Group
Ready, Set, Go! Ready – Preparing for the Fire Threat; Set – Situational Awareness When a Fire Starts Go – Act early A Time for Change: Become a Ready, Set, Go! Fire Department	International Association of Fire Chiefs , *Ready Set Go* Program
Prescribed fire can improve forest health and increase operational firefighting effectiveness, thereby reducing costs.	*One Message Many Voices* Video
Fire is an essential part of most forest and rangeland ecosystems, and is as natural as rain, snow and sunshine. It should be expected to occur in areas with fire prone vegetation. Its exclusion could result in more intense fires. • There have been dramatic changes in WUI, Wood and Weather. Decades of fire exclusion, growing fuel loads, increasing wildland urban interface, extended droughts, and changing climate have changed the dynamics of the fire environment. • At the height of fire season, fire behavior is often resistant to direct suppression efforts. Such efforts can be ineffective and may actually increase risk to firefighters.	USFS, Continuous Improvement in Decision-Making for Large Fire Management: 2009
Large, complex fires - called mega-fires - are increasing; these fires are also becoming more dangerous for firefighters… Although wildland fires are becoming larger, resources to manage them remain limited.	Ibid

Examples of Fire Management Messages	Source
Wildland fire is an essential, natural process.	National Wildfire Coordinating Group 2011 and *One Message Many Voices* Video
Society's influence has altered historic fire cycles, leading to a dangerous and difficult build-up of vegetation in our wildlands.	ibid
Land management agencies are committed to a balanced fire program that will reduce risks and realize benefits of fire.	ibid
Improving the health of the land and reducing risks to communities requires partnerships among Federal and State agencies, tribal governments, fire departments, communities, and landowners.	ibid

Forest Health

A 2011 study conducted for the Northeastern Area Association of State Foresters (NAASF), consisting of focus groups and surveys of residents and state foresters, identified a number of important considerations for the development of forest health messages (Responsive Management 2011). Significantly, an emphasis on ecological benefits (*i.e.*, clean air, clean water and habitat) of privately owned forests resonated with respondents. While respondents were more receptive to the term *healthy* forests than *productive* forests, most did not respond well to the idea that their forests are not healthy.

Other terms to which focus group respondents reacted positively included *forest stewardship, sustainable management, balance,* and *conservation*. However, the first two terms were not well understood by a quarter of respondents. Terms that were not received or understood well included *investment*, *preserve*, and *conserve*. Furthermore, messages that were framed in terms of losses rather than gains resulting from forest management activities or lack thereof were not received well (*i.e.*, "urban sprawl will result if forest stewardship is not practiced").

Patel *et al* also identified strategies for developing messages related to forest health. First, they stress the importance of changing the perception that humans and natural systems are incompatible to help increase public buy-in for management efforts. Second, they support the idea that appealing to self-interest is important, and echo Pelletier and Sharp's assertion that intrinsically-framed messages are effective. They suggest that appealing to psychological and spiritual self-interest is particularly important, because people value forests in part for "physical and spiritual health and for the services that forests provide" (Patel *et al* 1999).

Biodiversity is another complex forest health issue about which message communication can be challenging. Novacek notes that the very term "biodiversity" can be confusing to audiences, and that it is important to explain this term clearly and simply (Novacek 2008). Two related challenges are the need to explain:

- the importance of species interconnectedness, and
- the difference between mass extinction and background extinction rates.

Novacek suggests that: *"… the most penetrating messages are those that clearly relate scientific insights concerning biodiversity and biodiversity loss to more general environmental problems and, in turn, to problems rooted in common experience: poor water quality, depletion of fisheries, zebra mussels and other invasive species, forest clearing, open-pit mining, urban sprawl, and many others…"*

That species are the fabric of ecosystems, which in turn provide essential services, is a powerful concept, but one that may escape many of those unfamiliar with biological principles. Again, in many instances, it is best to enter these discussions from a practical and experiential starting point, often with a focus on current news (Novacek 2008). The National Voter Survey found that tree mortality from forest pests received the greatest concern when linked to the role of trees in ensuring clean air and drinking water (Fairbank*, et al,* 2006). Focus group respondents exhibited similar sentiments (See Appendix B).

A variety of videos from the "Don't Move Firewood" (DMF) campaign were released on YouTube by the Continental Dialogue on Nonnative Forests Insects and Diseases group as a way to reach a more diverse audience. GIC used several of these videos concerning forest pests to test how well they communicated their message and their potential outcomes (for more see Appendix B). Respondents observed that these videos stated forest pests, such as the Asian Longhorned Beatle or the Emerald Ash Borer, were a problem but the videos did not convince them because the messages lacked evidence of the problem, such as how much of the south was affected by the pests, why people should care (what is the bad outcome to avoid), and the seriousness of the problem. The videos could be improved in this instance by providing evidence that the problem is serious, widespread etc. and then show what may be lost (what ecosystem services) if the problem persists or spreads.

In addition, focus group participants noted that actions recommended were not specific enough. Many asked how far firewood could be moved: e.g. 10 miles? From outside a state forest to inside? From another state? Without such data and evidence of the destruction caused, some participants questioned if forest pests were a significant problem. The solution may be to make videos more explicit in providing recommendations beyond the catchphrase of 'Don't Move Firewood.' This concern was echoed by The Nature Conservancy staff (for more see interviews in Appendix C).

Other videos suggested people contact the “authorities” if they saw a strange bug, but participants thought that many people would find even typical forest insects “strange” simply because they were not familiar with them. They thought that each pest of concern should be described in detail, so that viewers knew precisely what to look for. They also were unclear as to what was meant by “the authorities” to contact. In every focus group, participants asked for a map that either showed the real spread of an alien invasive species or that presented a simulation of what an infestation via firewood might look like. None of the three videos in the DMF campaign had a detailed ‘spider web’ map showing patterns for the spread of invasive pests. The conclusion from these focus groups is that people generally want to be given evidence that a problem exists (raise their concern), and more specific instructions for what to do about the problem (motivate action and tell them what to do).

The Visit My Forest website suggests provides messages related to forest health. Its recommended actions for visitors to the site primarily concern leave no trace (when recreating outdoors) and six simple steps to protect and restore the world's forests. The steps (listed below) range from very specific 'clean your boots' to somewhat vague 'enjoy a forest near you.' Unfortunately, the messages do not provide the problem evidence most people require to motivate action nor do they provide much in the way of specific, meaningful actions.

1. Buy or cut firewood only near where you plan to use it; transporting wood can cause the spread of invasive insects and diseases.
2. Clean your boots carefully after hiking in a forest to avoid spreading diseases, such as sudden oak death.
3. Until stronger federal regulations are in place for plant imports, consider buying seeds or locally grown plants from nurseries.
4. Voice your concern about insects and plant diseases traveling on plant imports.
5. Work against climate change by supporting public efforts to protect and restore forests.
6. Enjoy a forest near you by hiking, birding, hunting or camping.

Examples of Forest Health Messages	Source
A Healthy Environment Grows a Healthy Economy. In Florida, forests cover more than 14.5 million acres - almost half the land area. Keeping forests healthy and productive isn't just good for the environment - it's good for the economy. The state's forests and forest products industries have a total annual economic impact of $16.5 billion, including 133,000 jobs.	Your Forest Managed, Florida Forest Service website
Management is Key. • Manage to protect water quality by keeping streams and lakes clean. • Manage to control debilitating disease and pests that ravage trees. • Manage to control invasive, non-native plants that destroy valued trees. • Manage to reduce fire-fuel brush buildup or competing vegetation in timber stands with prescribed burning. • Manage to renew your forest by cutting old growth and planting new trees.	Your Forest Managed, Florida Forest Service website
Well managed private forests protect water quality and wildlife habitat while providing a high quality, renewable timber supply.	Tennessee Department of Agriculture
Invasive species are harmful for the environment because they crowd out the native species. They are important for us to know about not only because of this crowding but also because of the potential they have for directly damaging our homes and landscapes.	Reilly 2009
Exotic, invasive species can cause big problems -- expensive problems. The Asian Long Horned Beatle, for example, has shut down wood commerce in many areas and caused the destruction of thousands of trees.	Reilly 2009

Land Conversion Impacts

The report *Southern Forests for the Future* by the World Resources Institute cites a number of economic, ecological and social benefits provided by the forests and highlights the impacts of land conversion as a key threat to these benefits. They note that the south is a hotspot for forestland conversion, explaining that six of the ten greatest losses of forestland to development occurred in the south in Texas, Georgia, Florida, North Carolina, Tennessee and South Carolina (in descending order) (Hanson et al 2010). The authors offer a number of solutions from conservation easements to tax incentives and more widespread forest management planning. However, as noted earlier in this report, only a small proportion of forest landowners have management plans. And as ownership parcels become smaller, it becomes less likely that a landowner will have an incentive to have a management plan or be able to manage at a scale that can make a difference.

The literature review identified a handful of resources with message development recommendations specific to land conversion impacts: an article produced by the Biodiversity Project (2011) provided recommendations for the development of messages concerning water in the Midwest. While these strategies are region-specific, they are likely to be applicable in the Southern Region as well. The strategies include:

- Connecting water issues to the economy.
- Connecting water issues to personal finances and costs.
- Including place-based examples.
- Using numbers, but sparingly.

The Georgia Legacy Project -- a non-government site -- takes a positive spin on forest land conservation "The economic benefits of conservation include increased property value, tax revenue generation, job creation and retention, and vital tourism and recreation industries." Unfortunately the web page does not offer specific actions that people can take once their awareness is raised, beyond making a donation to the project.

Message strategies related to land conversion are difficult because the actions to prevent it entail things one can do with their own lands (put land under conservation easement or minimize the built footprint) to policy and planning work such as creating open space and land conservation plans. This is perhaps the biggest gap in messaging. There is a great deal of literature existing that states land conversion is a problem but the solutions require a multi-faceted long term approach. Ultimately however, preventing the net loss of state forest lands is perhaps the largest challenge of all facing southern forests. In our concluding chapter, we offer specific recommendations and next steps to addressing this challenge.

Examples of Land Conversion Impact Messages	Source
Urbanization and development is the single biggest factor in loss of forestland acreage. Since 2001, 484,965 acres of forested land has been lost to land use changes; 64% of this acreage were cleared for urban development; 30% to agricultural uses; and the balance to other land uses.	Virginia Department of Forestry 2013
Water quality: Natural forests and well-managed plantations can protect drinking-water supplies. Managed forests usually have lower input of nutrients, pesticides and other chemicals than more intensive land uses such as agriculture. Forests planted in agricultural and urban areas can reduce pollutants, especially when located on runoff pathways or in riparian zones. However, trees exposed to high levels of air pollution capture sulfur and nitrogen and can increase water acidification.	Calder et al 2007
Riparian forests and wetlands can trap more than 80 percent of sediment and nutrients as well as reduce peak flood periods by 50 percent.	Georgia Forest Legacy
Erosion: Forests protect soils and reduce erosion rates and sediment delivery to rivers. Forestry operations such as cultivation, drainage, road construction and timber harvesting may increase sediment losses, but best management practices can control this risk. Planting forests on erosion-prone soils and runoff pathways can reduce and intercept sediment runoff.	Calder et al 2007

Examples of Land Conversion Impact Messages	Source
Climate change: Global climate models predict marked changes in seasonal snowfall, rainfall and evaporation in many parts of the world. In the context of these changes the influence of forests on water quantity and quality may be negative or positive. Where large-scale forest planting is contemplated for climate change mitigation, it is essential to ensure that it will not accentuate water shortages. Shade provided by riparian forests may help reduce thermal stress to aquatic life as climate warming intensifies.	Calder et al 2007
Forests protect drinking water, filter pollutants, and hold water in forest soils.	USFS Communication Guide 2009
Although forest lands provide two thirds of the Nation's water supply , their ability to do so is threatened by forest fragmentation and loss to development.	In *Planning for the Future of Southern Forests*
As urban areas expand into natural ones, unique problems arise. Natural systems are not given due consideration during the planning stage, and restoration efforts after development are often inadequate.	In *Planning for a Greener Kentucky*

Conclusion and Recommendations

In this section we recap briefly the main findings concerning the three focus areas and recommend areas for further research and focused message development. Readers are also advised to read Appendixes B and C for more helpful tips and findings from foresters and stakeholders.

Not surprisingly, the greatest volume of messages and unique message formats from video, to twitter feeds to full color guides, have been developed for the topic of wildland fire safety. This prioritization in message development is understandable, given the potential for loss of life and property. However, convincing people that wildfire is a problem remains a challenge in some states, such as Virginia, where large scale fires are less common. Showing fire risk maps to those focus group participants elicited surprise. This means that messaging about fire wise practices is likely to be less successful. More effort is needed to educate people about fire risk where perception of risk is especially low.

Forest health issues surrounding the invasion of forest pests is the second highest message area as these pests have the ability to devastate the economy and ecology of forests. Least developed are messages around land conversion impacts such as forest fragmentation, water quality declines and loss of habitat. However, forest land conversion and wildfire safety are directly related. The greater the amount of land conversion, the greater the likelihood that people have created new wildland urban interface conflict areas.

Messages about the amount of forest lost due to land conversion were often presented by forest advocacy groups or state forestry commissions rather than the agencies themselves. While states produced statewide assessments of forest resources in 2010 as required by the USFS (which then summarized those findings), the state assessments are not likely to be read by stakeholders targeted for WUI messaging campaigns. The primary intended audience for state forestry assessments are other agencies.

Florida, Virginia and Georgia are examples of states that discuss forest loss statistics on their websites where the generally interested public might find them (those people who would visit a state forestry agency website on their own without any external prodding). However, it is still not clear what people should do about this issue beyond

'plant more trees.' As reflected in the focus groups conducted by GIC, respondents expressed frustration about what they should do.

There are options to connect disconnected forests, avoid zoning that promotes sprawl-patterned development, educate developers about what they can do to develop in locations and patterns that facilitate forest land connection and avoid excessive land conversion. The challenge is in boiling down these solutions to simple key messages that move the message recipient from detection (awareness) to decision and implementation (action) phases.

While some studies relate forest loss to suburban sprawl, messages about what to do about this phenomena are lacking. States may mention these losses in their state forest assessments but also fall short in specific strategies to stem that loss. Solutions focus primarily on conservation easements or forest management plans, but offer little on how to address the causes of this problem.

While sprawl-patterned development and encroachment of new subdivisions are mentioned, the cause of that sprawl -- inadequate zoning, lack of risk awareness by public officials, building in fire prone areas -- are often not addressed in message development. The GIC tested some of these concepts about land conversion through its focus groups. Participants also felt that, as individuals, the problem seemed too great to address. Perhaps the more appropriate audience for action messaging in this instance is local government and developers.

Based on the scale of the problem -- forest land conversion and fragmentation are repeatedly noted as one of the greatest threats to southern forests -- we recommend that this topic be a primary focal area for future research and key message development.

A great deal of messaging was developed for forest health related to problematic forest pests. The primary finding of these messages in terms of future needs are to: 1) Present those messages in places where forest users are most likely to see them such as at campgrounds, entrances to forests and in common places people visit, such as plant stores and tree nurseries etc. The decision and action phases for these messages about forest pests also need more work. As GIC focus group participants noted, advice such as 'contact the authorities' or 'report strange bugs in the woods' were not specific enough to ensure proper reporting and action. Other invasive elements, such as invasive plants, also are a problem and should receive greater attention.

One challenge of the WUI area is that its residents are often not traditional forest agency stakeholders. However, these non-traditional stakeholders may own significant tracts of forest land -- both individually and collectively -- but they are less likely to call (or know about) their county or regional forester. They are likely not aware that forests may need management or that their homes are at risk from wildfire. Strategies are needed to reach those residents who would not, on their own, visit a forest agency website or contact a local forester.

Lastly there is a great deal of messaging that may not be having the intended effect. We strongly recommend all messages be tested for relevance (based on intended audience) as well as whether they are having the intended results; whether that is increased awareness, taking action or both. Terms such as fragmentation, land conversion or even wildland urban interface, are not well understood by the general public or even by elected and appointed officials who are making decisions every day about whether, when and how to develop. Terms should be tested before using them widely.

In summary, recommended next steps for research and actions in this field are to:

- Evaluate ***message effectiveness***, both pre-release and post-release.
- Ensure that campaigns contain ***locally relevant materials*** and information, whenever possible.
- Expand capacity to ***reach non-traditional stakeholders***.
- Develop more messages about the importance of the ***forest economy*** (to highlight the value of forests).
- Develop new messages about the causes and impacts of ***land conversion*** on water, fire risk and

wildlife habitat.

- Develop messages targeted to ***actions that citizens, planners and developers*** can take to prevent land conversion (beyond fire safety).

Appendix A: Literature

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Appendix B: Wildland Urban Interface Messaging Focus Groups Summary

The Green Infrastructure Center (GIC) held four focus groups on messaging for the Wildland Urban Interface (WUI) during the spring of 2013. Focus groups were held in Tampa, Florida; Asheville, North Carolina; Austin, Texas; and Charlottesville, Virginia. The focus groups concentrated on existing messages about forests that covered wildfire, forest health (invasive pests), forest land conversion impacts (to wildlife and water). The sessions also investigated general attitudes about forests, management and terminology.

Those messages presented to attendees were provided in written, video, and slideshow forms, in order to address different individual learning and communication styles.[3] A diversity of stakeholders were invited to attend. They included rural and forest landowners, elected and appointed officials, forest managers, and neighborhood and homeowners' association representatives.

Attendee Overview

In total, fifty people attended the four focus groups. About three-quarters of them managed or made decisions regarding woodlands, while two-thirds of those who were not managers still regularly used or enjoyed woodlands.

Roughly half the attendees described the size of the woodlands they managed and for how many years. The acreage ranged from three acres to more than 5,000, with a third managing less than 20 acres, and 40 percent managing 20 to 100 acres. A third of the participants had owned or managed their woodland for less than ten years, while about a quarter had managed or owned their woodland for between ten and 20 years. While only half of the attendees noted that they owned or managed woodlands, more than 80 percent lived in or near a woodland – 40 percent within a woodland and 53 percent less than a mile of a woodland.

There were clear patterns in how participants preferred to receive information. Half of them preferred either the Internet, small group, or one-on-one conversations, or preferred to read brochures or reports, rather that other choices, such as social media or television. Approximately 80 percent preferred to get their information from woodland professionals, such as county foresters or companies. Films, videos and newsletters were ranked lower: either as 'somewhat preferred' or as 'not preferred.' Almost none of the respondents preferred billboards as a way of receiving information.

As for the most trusted sources of information, about 94 percent of responses chose experts (foresters or field scientists), followed by personal searches on the Internet (61percent) and then reports (53 percent).

Clear patterns emerged when participants were asked to rank why they owned or appreciated woodlands (respondents checked all that applied). Almost all of them valued their woodlands mostly for their for scenic or natural beauty (96 percent) and wildlife (98 percent). The majority appreciated them for non-consumptive recreation (84 percent), existence value (74 percent), and privacy (68 percent). Roughly half valued them mostly for their timber (48 percent) and for consumptive recreation (48 percent). Others stated that they most valued woodlands for their ecosystem services (14 percent).

[3] Copies of the slide shows and survey instruments are available from GIC.

Attitudes Regarding Forests, Management and Terminology

Defining Forests

Participants were asked to define a forest, as well as several forest-related terms. These had been identified during the GIC's literature review as terms that may be confusing as to scale of reference.

Most participants identified a forest as an area having trees. Many others extrapolated on the theme and described a forest as a system of trees and other vegetation and animals. Most participants said forests could be of any size, but many also stated that they had to be of a minimum size; suggestions ranged from several acres to multiple square miles.

The majority of attendees believed that forests could be anywhere, although some believed that they could not be inside urban or very developed areas. A few stated that they could be anywhere the climate was adequate.

When asked what a woodland was, most participants differentiated them from forests. Woodlands were seen as smaller and more urban than forests, with different types of trees of different density (less or more) than a forest. Uses were also differentiated for woodlands and forests. Some saw woodlands as exclusively for harvest while others believed they were private lands. Still others thought they were for public use only. On the other hand, many attendees believed that 'woodland' was just another name for a forest. Woodlots were mostly defined as small areas (44 percent), or as an area planned for tree harvest (31 percent).

Forest Management Roles and Attitudes

Participants were asked a series of questions regarding their own role and the roles of others in managing forests. Almost all agreed that their personal decisions affected the health of their woodlands (90 percent). They agreed that they had a responsibility to take care of their land (88 percent) and believed that all woodland landowners played a role in the condition of their woodlands (96 percent).

When it came to managing forest land in cooperation with others, support was strong but not as unified. Most landowners (78 percent) were interested in seeking professional advice on managing their woodlands. Furthermore, the majority (76 percent) believed that each woodland landowner should also be concerned with the management of adjacent lands. A lower number (66 percent) were interested in making joint decisions with adjacent landowners regarding the condition of their woodlands. Overall, this shows strong support for proper management, but less support for coordinating forest management outside personal property boundaries.

Understanding and Defining Jargon

The Wildland Urban Interface (WUI)

Forty participants responded to this phrase, while five (12.5 percent) did not mark that they were very familiar with the term. All of the 40 wrote definitions that were accurate interpretations of the WUI. Another five respondents marked "very familiar," but did not provide a definition.

Overall, this suggests that participants either were familiar with the term or were able to come to an understanding of it based on the term itself. Almost all respondents who wrote definitions equated it to the proximity of people (development, urban, suburban, humans) to wildlands (forest, open space, natural areas, nature).

Forest Fragmentation

Sixty-six percent of participants chose to rate their familiarity with this term and define it. Two of them simply marked "very familiar" and offered no definition. Of those who chose to answer, 26 respondents (78 percent) gave answers that related forest fragmentation to a disruption or disconnection of the forest by development or non-

natural land uses. Fifteen percent (five respondents) wrote definitions that were inaccurate and did not address changes in connectivity or land use; these definitions focused on changes in ownership, changes in tree species, or division of parcels.

Sustainability

Most participants (82 percent) answered this question. Five respondents (12 percent) provided no definition. Those who did provided definitions that varied widely, and mentioned topics ranging from "systems that were managed" to "natural areas that can exist without human interference." Some definitions mentioned products or energy sources but not natural areas. Only two responses mentioned the "3Es" of economy, ecology and social equity. The most noted concept was that sustainability has to do with time (39 percent). Other words or concepts that were consistent were maintaining (15 percent), management (12 percent), resources (12 percent), use (10 percent) and systems (10 percent).

Ecosystem Services

Slightly more than half of focus group participants responded to this question (54 percent). Four responses were marked "Very familiar," but provided no definition. Twelve of the responses (43 percent) approached the general idea that ecosystem services are services provided by natural systems to humans. Some specific services were mentioned. Carbon sequestration and water quality (five responses each), air quality and stormwater services (four responses each), oxygen production (two responses) and recreation, general pollution removal and temperature reduction (one response each).

Eleven responses (39 percent) indicated that focus group attendees were very familiar with the term, but did not provide an accurate definition. Of those responses, five indicated that ecosystem services were provided by humans to ecosystems, four confused them with sustainability or ecology, and two defined them as companies or experts that did ecological work.

Hazardous Fuels in Forests

This term was not tested at the Virginia focus group, but was added afterwards, at the request of the Texas Forest Service. Thus, only 41 participants were able to respond to it. Thirty-three (80 percent) answered the question. Only five marked that they were very familiar with the concept, and none of them provided a definition (15 percent). Of those that defined the question, all but one (27 definitions, or 81 percent of total responses) were able to define it adequately as a buildup of natural fuels that poses a wildfire risk. The outlying response was a guess, defining hazardous fuels in forests as "fuel spills?"

There were some apparent trends in the definitions for hazardous fuels in forests. Twelve (44 percent) included words that mentioned a large quantity of fuel. Nine (33 percent) mentioned fuel build-up in the lower heights of the forest, employing words like "understory", "underbrush," or "forest floor." Ten (37 percent) referred to specific fuels, such as litter, duff, pine needles, dead wood, Yaupon and Cogan grass.

Wildfire

Perceptions of Risk and Management

The majority (87 percent) of focus group participants were concerned with loss of property or life from forest fires. Of the 13 percent who were not concerned, more than half could not recall a fire ever occurring near their property. Of the remainder, 33 percent had taken actions to reduce wildfire risk or had been able to obtain fire fighting services (23 percent).

Four questions addressed prescribed fire. One focused on its use to prevent large-scale wildfires, a second asked about trust in resource professionals, a third enquired about its use for ecological management, while the final question asked about perceptions of prescribed fire by the general public.

Almost all participants (98 percent) supported prescribed fire to avoid larger wildfires. Many referenced the need to keep fuel loads under control, that it mimicked nature and was a proven strategy. The single participant who did not think it should be used thought there was not enough ability to control it. Some participants echoed this concern when asked if they trusted resource professionals and three noted that accidents can happen despite planning and experience.

Overall, trust levels were high, with 84 percent agreeing that they could trust professionals to control intentional fires and keep nearby properties safe. Only 16 percent were unsure that they could trust the professionals. Most (90 percent) agreed that fires should be used by professionals to help woodland plants and animals, but many responses (22 percent) asked for more information. A number of written comments (10 percent) were concerned that the fires would help the plants but were not sure how they would help animals.

None of the participants believed there was widespread support among the public for prescribed fire. Most (67 percent) stated that it was somewhat supported and 33 percent did not know.

Familiarity with Fire Terms: Ready Set Go!

After they were shown a video introducing the "Ready Set Go!" (RSG) program, attendees were asked to describe what each of the three parts of the slogan meant. All respondents understood the "Ready" component. Most used language from the video, including "hardening the home" and "defensible space." Everyone understood that the message was: Be prepared for wildfires. Some participants did not understand the "Set" component, or believed the video was not clear (6 percent). Most believed it meant you should prepare and plan for evacuation. All participants clearly understood that "Go!" meant to evacuate as soon as the word was given, without hesitation.

A small discussion about the video followed the written responses. At all workshops, participants thought the video was good, but wanted to have more information and steps on what they should actually do. Also, many thought the tone was intense, even terrifying. While several commented that it helped get their attention, a few questioned whether the word "Armageddon" – a biblical reference – was appropriate; they felt it was either too extreme or would not mean much to anyone who did not know the Bible.

One participant stated that wildfire, if managed well, did not have to be a disaster and that the video should have some information on prescribed burns and management. Many others wanted more visuals, including more images of damage after a fire, as well as more images that were region or state specific (the mountains in the video were noted by participants in Florida as inappropriate). People also requested that the statistics be more state-specific.

Participants would have liked more data and information on the speed at which wildfires can move. Many commented that the role of volunteer firefighters and the risks to them should also be a focus of the film. And they also asked for more examples or definitions of terminology, such as "buffering," "hardening the home" and "creating defensible space."

The many requests for more information to be provided in the video led one participant to ask what the point of the video was. Was it designed to make us seek more information, or was supposed to provide "All you need to know"? In Virginia, several comments asked for the video to focus on introducing the subject and give clear sources of further information, other than "Call your local fire department."

In Florida, attendees compared RSG to preparing for a hurricane, based on the hurricane warning system. Floridians also commented that clearing trees for defensible space would require a permit.

Appreciating Fire Risk

Fire risk maps were shown for the state or area where the focus group was held. Most attendees were not surprised by it (73 percent). Of those who were surprised, about 50 percent believed the risk facing their own woodland would be higher, as would be the extent of the risk area. Fifteen percent were surprised to see risk in predominantly urban areas.

In Texas, 37 percent of participants commented that they had already seen similar maps. Since their workshop was held in an area that had recently suffered a large wildlife, they were highly aware of the issue.

FireWise

The majority of participants (72 percent) had heard of being 'fire wise.' When asked what it meant, almost all participants said it had to do with preparing properties to reduce the risk of wildfire damage. No responses directly noted the *FireWise* program.

Hazardous Fuels

Note: Questions about hazardous fuels were not asked in Virginia because they were added after that focus group at the request of the Texas Forest Service.

In response to a question concerning the term "hazardous fuels," 80 percent of participants were familiar with it. When asked to define it, all participants noted that it meant combustible organic litter and vegetation. Some even noted specific problem species, such as Cogan grass or Yaupon.

A similar question asked if participants had heard of "hazardous fuels reduction." Most (95 percent) had, and they defined it either as reducing fuel (biomass, litter, dead vegetation and duff) or properly managing lands for wildfire. A few commented that the term could be confused with HAZMAT by the general public and offered alternatives such as "forest thinning."

Invasive Pests

The focus groups watched three videos from *Don't Move Firewood* (DMF) campaign, which is intended to educate the public about how moving firewood can quickly spread invasive species and why that is harmful to America's forests. Responses were offered in a facilitated discussion format.

In general, the groups found that the DMF videos were somewhat silly; especially those which used costumed characters. They felt that, while they would be effective for children and got the basic message across, they lacked enough data, such as how much of the south was affected by the pests, why people should care, and figures to show how serious the problem was and to answer such questions as, 'Will there be a total loss of ash trees from the emerald ash borer?' Many asked for information on how far firewood could be moved: e.g. 10 miles? From outside a state forest to inside? From another state? Without such data and pictures of destruction, some participants questioned if this was even a problem.

The videos suggested people contact the "authorities" if they saw a strange bug, but participants thought that many people would find even typical forest insects "strange" simply because they were not familiar with them. They thought that each pest of concern should be described in detail, so that viewers knew precisely what to look for. They also were unclear as to what was meant by "the authorities" to contact. In every focus group, participants asked for a map that either showed the real spread of an alien invasive species or that presented a simulation of what an infestation via firewood might look like. None of the three videos in the DMF campaign had a detailed 'spider web' map showing patterns for the spread of invasive pests.

Forest Land Conversion

Despite a significant amount of academic literature on the effects of forest conversion on habitat, ecosystem services, wildfire and many other issues, no significant messages could be found at state forestry agencies beyond general

statistics on the net amount of forest land loss. In some states, forest advocacy groups and associations were the only entities with such numbers. As a result, the Green Infrastructure Center presented materials it has created to the focus groups to assess the ease with which concepts about forest land conversion could be understood.

Overall, participants found the information useful. Many learned new information about habitat fragmentation. Others had never heard about interior and edge habitat and, after seeing the materials, suggested that new houses should be put at the edge of the woods, not in the middle.

The reduction in habitat functionality and ecosystem services was also apparent to the audience. One participant in Florida noted that these were very important since, once land was converted, it could never change back. Many more noticed challenges that would have to be overcome to reduce forest conversion. These included a lack of planning tools, such as transfer or purchase of development rights, the need for markets that fostered a demand for conservation subdivisions that left some land as open space, difficulties landowners faced in cooperating to create connected landscapes, political obstacles, financial bottom lines, subdivision rules for overly wide roads and minimum lot size regulations that drove forestland conversion, and many more issues.

Helpful criticisms were also received. Some participants commented that not all edge habitat is bad habitat and that maybe the presentation should focus on the quantity of edge versus interior habitat. In other words, the issue is not that edge is bad, but there is not enough interior habitat. (As a result of these comments, the staff have since introduced new graphics on edge benefits and types of edges).

Other comments noted that messages about thousands of acres lost per year were at a scale that left the average homeowner feeling they had no role in the solution. One stated that, "I feel like a victim." They asked how homeowners could become empowered by this message. At another focus group, a participant stated that it was the government's job to fix this problem, but that it would require public support to do it well. As a result, successful outreach and messaging were required.

Forests and Water

As with forest conversion, the influence of forests on water quality and quantity is quite clear in academic and professional literature, but is generally lacking in public messages. The GIC presented its own material to the focus groups to assess the ease with which the concepts presented could be understood and transferred.

As with forest conversion, participants immediately started brainstorming on how to fix problems with water supply, quantity and quality, and with forest cover. Multiple focus groups noted that many developers, including departments of transportation and the agricultural industry, do not consider natural land cover and stormwater in their construction plans. In North Carolina, it was noted that this often leads to stream channelization that exacerbates erosion. Additionally, many noted that natural drainage conservation should be considered when developing.

There was some concern that local conditions require different information. In Texas, participants were wary of too many trees in a watershed because of concerns about drought (trees absorbing too much groundwater). They thought that too many trees during a drought could reduce the water available for communities and noted that there was a program to cut down trees to increase water supply. Texans suggested that the message should be tailored to having the right trees in the right places, as opposed to having more tree cover in general.

Texans also wanted native grasses and non-forest vegetation to be addressed. They would like to see a plant list that identified non-native plants, 'water hogs' and those plants that are beneficial for the water supply. It was suggested that this plant list and overall water messaging could be tied to future water supply issues.

In Florida, participants explained that many local residents were concerned about water safety, such as poisonous snakes and alligators, which caused them to clear vegetation right to the edge of the water. It was believed that many of them would choose to mow for safety rather than have a forested buffer for water quality.

Future Generations

A final question asked participants if concern about future generations was effective messaging about forest conservation. Almost all (92 percent) believed it was effective. Their written responses ranged from the effectiveness of using terms like "think of the children" to "the sustainable use of resources for future generations" and "exposing children to the woods is good for both them and long-term sustainability."

Appendix C: Messaging Interviews with Forestry Professionals

A number of questions were posed to forestry professionals by phone in July and August 2012. These professionals included forestry staff who are public relations or outreach officials for state divisions of forestry, as well as those who coordinate outreach programs such as *FireWise*. The questions covered the three topics of this report: fire management; forest health (pests and pathogens); and land conversion impacts (forest fragmentation, water supply and water quality).

Questions asked

The following eight questions were asked:

1. What process do you undertake in developing messages? Are there key strategies or steps that you think are especially helpful?
2. What messages have you found to be the most effective or important regarding the topics of water, forest health and sustainability, and fire management? [4]
3. How have you tailored your messaging to landowners, local governments, and businesses?
4. Are there messages that you think have been problematic or lead to confusion or misunderstanding?
5. What communication strategies have you found most effective in relaying these messages?
6. Have you had any challenges in implementing these strategies?
7. Do you have any lessons learned from communicating with stakeholders in the past?
8. Do you have any publications (newsletters, video, news stories) that you can share with us on this issue?

List of interviewees

- Epney Brasher, Associate State Forester, Louisiana Department of Agriculture and Forestry.
- Russell Bozeman, Director of Forest Protection and Forest Information, Mississippi Forestry Commission.
- Burl Carraway, Department Head, Sustainable Forestry, Texas A&M Forest Service.
- April Saginor, Communications Specialist, Texas A&M Forest Service.
- Justice Jones, Wildland Urban Interface and Prevention Program Coordinator, Texas A&M Forest Service; SWUIC member.
- Leigh Greenwood, Coalitions and Networks Manager, The Nature Conservancy.
- Charlie Marcus, Urban Forestry Coordinator, Florida Division of Forestry.
- Linda Moon, Communications Manager, Texas A&M Forest Services.
- Chelsea Parker, Public Relations and Communications Coordinator, and State Wildfire Prevention Coordinator, Florida Forest Service.
- Tim Phelps, Forestry Communications and Outreach Unit Leader, Tennessee Department of Agriculture.
- Julie Shiyou-Woodard, Wildland Urban Interface Coordinator, Alabama Forestry Commission.
- Bonnie Stine, Cooperative Forestry Assistance Supervisor, Florida Division of Forestry.
- Joe Pase, Entemologist, Texas A&M Forest Service.
- Lynn Tru, Information Officer, Kentucky Division of Forestry.
- Bruce Woods, EFO, CPM, Department Head Mitigation and Prevention, Texas A&M Forest Service.

[4] These topics were slightly changed at the request of the Forest Services during the project to land conversion impacts (forest fragmentation, water supply and water quality); forest health (pests and pathogens); and fire management.

Some respondents provided additional information through follow-up emails.

Many more emails and letters were sent out to forestry staff in every state in the USDA Forest Service's Southern Region. They were also phoned to request an interview. The following summary of responses includes the results of those who did reply and to them we express our deepest appreciation.

Summary of Responses

The responses given in the phone interviews and returns by email and letter have been grouped according to the questions that were asked.

1. What process do you undertake in developing messages? Are there key strategies or steps that you think are especially helpful?

Several respondents noted that they confer with subject matter experts when deciding on messaging strategies. Others explained that they consider the intended audiences and tailor their messages to resonate with their particular interests. However, a few respondents noted that it was difficult for staff to get out of "scientist/forester speak." A few held small group sessions (focus groups) to determine if their messages were "on target." They also considered the education levels and existing knowledge of their audiences when creating appropriate messages, such as laypersons versus those who are forestry professionals. Others noted the importance of "before, during and after" communications, as well as providing "two-way communication or interactivity between everyone." Many noted the helpfulness of existing programs such as *FireWise* to provide ready-made messages.

Several respondents identified the need to create messages tailored to specific audiences, but not every state had access to location-appropriate materials or media experts. Some states, such as Alabama and Texas, had established messaging programs and enlisted media specialists in message development, but other states did not: instead, they relied on resource professionals within their agencies.

Several noted that the *FireWise* program is a good tool, but cautioned that it depicts a lot of Western information. One respondent noted that, "We hand out literature showing a California house and that creates a disconnect because it is obviously not from around here. It makes it hard to relate and we lose behavior change moments." This also relates to credibility issues.

Respondents from Texas and Oklahoma noted that the *One Message, Many Voices* campaign materials were not well received because they were specific to Florida, Georgia and South Carolina. To address this, Texas created its own video with local landscapes, vegetation and fire fuel types.

Tennessee noted that, "Informing before educating is a key strategy." Raising awareness about the number of fires in their area, the fires' destructiveness, especially the number of homes burned, was key to gaining interest in the messages. After presenting that information, Tennessee tells residents how they can protect their community. They also utilize "key local leaders" to become "community champions" who will drive and sustain the program. These can be community organizers, passionate residents, mayors or county commissioners.

Some states branched outside of their local agency to work with other agencies that are routinely in contact with local residents, such as Soil and Water Conservation Districts, to share and distribute materials. Several respondents utilized sporting events (especially football) and popular sport mascots to spread the word to larger, non-traditional audiences.

Many programs depend on grants programs to fund message distribution. While this can help with promotion and distribution, grant funds may not be consistently available year to year. One respondent stated that having a grant coordinator was key to funding message development and outreach.

2. What messages have you found to be the most effective or important regarding the topics of water, forest health and sustainability, and fire management?

Several states noted that they just use *FireWise*, *Ready, Set, Go!* and *Changing Roles* materials for their messages. (See http://wildlandfirersg.org/.)

For messages about fire, Texas helped constituents relate loss from timber damage due to natural disasters and wildfire to aspects of their everyday life, such as the amount of timber required to build a certain number of homes, produce a certain amount of paper, print a certain amount of books, etc. They also correlated the amount of acres in forestland to known geographical features, such as the size of certain US states. One forester noted that, "It seems to help people understand just how big 64 million acres actually is."

To gain more traction with local and state officials, Texas also related the economic impact of sustainable forestry to local and state economies. They appealed to other community values; for example, they related the benefits of forestland to wildlife, aesthetics, clean water and air. They found this particularly helpful in reaching the "new generation of landowners, as well as those living in metropolitan areas."

To create a message with resonance, Texas created a takeoff on the popular Star Wars movie theme with its *May The Forest Be With You* campaign. They used this theme to explain the link between forest products and sustainability. They explained that forest benefits are not just within the woods but are everywhere – food, books, clean air/water. Their message is, "No matter where you are, the forest is with you!" This campaign was successful and particularly useful with legislators. Rather than 'traditional messages,' they discussed forest benefits and their economic impact, which was an effective approach to get legislators' attention in light of the economic downturn.

Alabama felt that messaging seemed to be most effective when promoting the importance of a healthy forest instead of the safety/protection angle. While they noted that there was not 'hard data' to back up that claim, they explained that they did not have much structural loss of forests despite having 'many fires.' An example of an appeal to residents was offered: "I can tell them under the right conditions we will be unable to save your house. That wouldn't work. Instead I go for the 'you live next to a bird sanctuary, that's why you bought this house. Imagine if the whole sanctuary burned down.'" They noted that this 'recreation angle' was far more effective because it was seen as key to lifestyle quality.

Texas staff found that messages that tie in the idea of personal responsibility are important. They noted that Texas is a private property rights state, with just three percent of its land in federal ownership, so most messaging is targeted to private landowners. Messages center on residents' role as part of the solution.

Texas staff also took advantage of timing by targeting messages to constituents during 'bad fire seasons' when the audience is most receptive. They also utilized those times to bring in messages from the forest resource management side. Conversely, in wet years, programs such as *Emerging Communities*, which focus on sustainable communities, were useful as they also included information about fire prevention.

Several respondents noted that line staff are not authorized to use social messaging and had to rely on communication specialists if they wanted to post any messages to, for example, a web site or Twitter page.

Social messaging was effective if they were "positive, short messages that suggest people can help or tell them what to do." However, staff noted that issue awareness was key in order for those messages to be effective. One respondent explained that, "People get confused if they haven't heard the message and don't know why they should be taking action."

The Florida Forest Service began an active social messaging focus in 2011. Each mitigation specialist/communication officer manages a Twitter site for wildfire prevention messages, forestry messaging and general wildfire information. Staff found that this approach was effective and the inclusion of smart phone integration has allowed them to share information in real time by linking fire prevention messages with active wildfire information.

Florida found that catchy slogans, such as "Do your part, don't let a wildfire start!" captured peoples' attention. However, they did not focus on water and forest health message delivery in WUI areas. Mississippi found that urban

forestry could use fire as a good way to 'hook people' to take an interest in better urban forest management. They were then able to incorporate water and forest health messages. *FireWise* efforts provided a jumping off point for doing more things.

Tennessee staff noted that, lacking metrics and measurements, it was difficult to correlate messages to changes in behavior. They explained that, while they are talking to more people about fire prevention and recording attendance at events, they could not directly determine how many fires were prevented. They were also training volunteer fire fighters. Tennessee has had a decrease in fires, but weather-driven fire risk has also decreased, making it difficult to correlate the degree to which building greater fire awareness has resulted in wildfire reduction.

Multiple states noted the difficulty of explaining 'prescribed fires,' since people do not understand what they are, or they still believe that all fire is bad.

3. How have you tailored your messaging to landowners, local governments, and businesses?

Texas creates simple, jargon-free messaging with illustrations to show best practices when developing WUI products for homeowners that relate to landscaping, home construction or ember awareness guides. They appeal to local governments by letting them know how the forest agency benefits their community and helps them do their job. They also make sure to focus on economic impacts as well as the fire aspects of living in WUI areas. Texas has had a "horrible fire season," (2013), which has helped them create interest in their fire safety and forest restoration messages.

Texas also tailored its messages to other audiences by using other values; for example, it emphasized to homeowners the quality of life that forests provide, the increase in property values, the reduction of energy costs, recreational opportunities, and so on.

Several respondents agreed that, to gain message importance, it was useful to focus on the economic impact that forestlands have on their region or county. Texas noted that forest production is typically the number one employer in most counties in east Texas, so jobs and income are effective messages in that region, while in the rest of Texas, quality of life is a more effective message.

Many respondents noted that messages need to be tailored differently for rural and urban audiences.

In urban areas, Texas focused its messaging on how important urban forests were to attract residents – and thus more tax dollars and local spending – with local officials. Businesses were targeted with messages on the importance of using wood or wood-based products in their businesses, as well as being a 'green business' since, "Every business wants to be *green* and no other product is greener than trees!"

4. Are there messages that you think have been problematic or lead to confusion or misunderstanding?

Prescribed burn messaging proved difficult for most states. A respondent explained that, "Many people don't understand what it is, because they believe that all fire is bad. In areas where prescribed fire is used, people aren't aware of what is going on and don't know why smoke is there. They don't want it around."

Several respondents noted that smoke resulting from prescribed fire was also a challenging issue to explain, since many residents saw it as cause of air pollution. One respondent noted that, "People have a hard time understanding why we would intentionally set a fire. I think we could probably do a better job of distributing literature that really explains it – and I think that could easily be accomplished with the *One Message, Many Voices* Campaign."

Another respondent noted that, "There is not a level of fear that people will lose property to a fire." Several foresters noted that while the southern region has more fires than anywhere else nationwide, fires are still not on people's radars as a big deal.

Another forester commented that residents wanted to know why their forest agency did not work with insurance companies to obtain discounts for fire-wise houses. This forester explained that insurance companies are not

interested in the South because their baseline loss due to fire is negligible. He noted that, lacking any financial incentive, it is difficult to get landowners' attention.

Timber harvesting and the importance of forest management were also challenging concepts to communicate. One respondent explained that, "The idea of timber harvesting and how that promotes healthy forests sometimes is not understood by those outside rural areas." Another noted that the public did not understand the idea of timber harvesting and reforestation. Economic benefits were also challenging to communicate to the public who did not live in areas where logging occurred; they also were not aware of how many wood products they use on a daily basis.

Texas has invested extensively in creating its own state-specific materials. Its respondents noted that WUI is not a familiar term to most people. Their materials explain their agency's role, as well as what residents can do. However, staff noted that watershed issues have been contentious in Texas. Species that would have normally been minimized by fire are now out of balance. Homeowners who are new to WUI areas are challenged by their perception of 'natural,' as well as by landscape aesthetics and a desire to change the landscape. One forester noted that it was difficult to tell residents that, if they become good stewards, their landscape would look really different.

Messages that attempted to stop the spread of impactful or invasive pests also proved challenging. Staff from the Nature Conservancy highlighted that the *Don't Move Firewood* message was confusing. Staff noted that people asked what was meant by 'don't move firewood' and how far was too far.

In trying to taking advantage of timely situations, Florida, following the 2004-2005 hurricanes, implemented the 'Your Forest Managed' strategy (see http://www.yourforestmanaged.com/), which promoted forest management for improved resilience to storms and increased health. They found that the message itself was too broad and met with only moderate success. These results were assessed in part by web visits and the distribution of brochures and publications.

Mississippi found it easier to communicate with landowners since 80 percent of forest land is owned by private, non-industrial landowners and most of them actively manage their forests. According to the forest agency, Mississippi may have the largest number of certified American tree farms in the nation. However, the state has not had a catastrophic fire incident, which makes communications about fire risk itself more difficult.

One state noted that one downside of social messaging was getting participation from older residents. There was a reticence on the part of older users to using new technology, such as tweets and smart phone alerts.

Messaging to people without a rural background was also difficult. It was suggested that messages to new WUI residents needed to be much clearer about the benefits of targeted behavior changes. However, several respondents noted that forest health, sustainability and preserving clean water resources resonated more closely with new WUI residents' interests and understanding.

Staff lacked training in messaging about 'social issues.' One respondent noted that, "We need a staff that can carry out all of these ideas and also on different communication venues such as Internet, social media, press releases, etc. These methods and approaches require a lot of people and a diverse skill set."

5, 6 and 7. What communication strategies have you found most effective in relaying these messages? Have you had any challenges in implementing these strategies? Do you have any lessons learned from communicating with stakeholders in the past?

Questions five, six and seven cover the general area of most effective strategies and lessons learned from those strategies.

Texas, which noted their very challenging fire seasons in recent years, has had a better response to their outreach efforts due in large part to increased awareness about fire dangers. By partnering with local fire departments on programs that the departments can deliver themselves, the Texas Forest Service has been able to expand its reach. They explained that Austin now employs a WUI specialist whom the Texas Forest Service has assisted in training and engaging. These established relationships mean that representatives are more likely to call TFS if they have questions.

Staff from The Nature Conservancy explained that their extensive external research showed that direct mailing is the most effective outreach method for informing the public. They felt that videos did not result in a great deal of follow-up hits to their websites and were not a good investment when comparing production costs to outcomes, so TNC's future focus will be on producing a few 'key videos' instead.

Several interviewees noted the importance of using data and statistics when making their case, such as the number of structures destroyed or threatened, the number of fires that broke out, etc. Another added that multiple impression points with the same audience on a single day are fairly effective in getting messages across.

Multiple venues were also key for getting messages out. Tennessee conducts messaging through community events, state and county fairs, Smokey Bear in schools, community *FireWise* programs, press releases, radio advice for debris burning, and advertising for fire prevention. In their online permit system, Tennessee leads people to visit www.burnsafetn.org. Other respondents noted this multiple-avenue approach was a good way to spread the word.

As noted earlier, in 2011, Florida started to employ new social media tools. Each mitigation specialist and communication officer manages a Twitter site that provides wildfire prevention messages, forestry messaging, and wildfire information in real time. The messages incorporate fire prevention messages with wildfire information.

Interpersonal skills were also emphasized by several respondents as important. Several noted that county foresters are trusted within the communities and this person-to-person approach is often more effective than a simple media spot.

One respondent explained that, "Stakeholder groups have a vested interest in the message so when working with them you must remember to consider their ideas and listen to them. It's sometimes easy to enter a forum as a leader and try to push your particular way of promoting a message without really considering the opinions around you." The respondent also suggested that staff keep messages simple and short and avoid being overly technical or redundant. They suggested that messengers should, "Use more graphics with less words, make short bulleted notes to speak from, and to try and keep things concise to maintain interest."

On-going messaging was also emphasized. One respondent noted that, "There needs to be a calculated effort to relay these messages throughout the year and over time." They suggested that messages should not be promoted only when there is a trigger event (i.e. natural disaster, wildfire, etc.), but also "continuously and routinely."

8. Do you have any publications (newsletters, video, news stories) that you can share with us on this issue?

We used this question to provide the project with a list of further publications and websites, with which to conduct more research. We followed up all the suggested publications and web sites, and those that were found to be useful have been included in the appendix that contains the sources for this report.

Other Emerging Issues that Arose from the Responses

Two issues were identified as emerging conflicts that will need more attention in the near term.

The first relates to varying specialties. One respondent explained that, 'Urban foresters and WUI specialists and traditional foresters all have different focuses in their practice. Urban foresters work diligently on tree preservation ordinances, but that can become the reason for WUI problems. Tree preservation policies apply to areas inside municipalities. As urban areas grow, urban trees are in fringe areas. Policies in those fringe areas to protect urban trees can be restrictive and limit residents from protecting homes and properties. They need to look at models for balanced tree management – rather than leaning on one side or the other. This will take a collaborative effort.'

Another issue focused on over-reaction to WUI messages. Tennessee hosted an after-the-fire recovery workshop. They noted that after a fire, residents sometimes cut down all trees and clear lots, even though the trees were not the problem. To address this, Tennessee has begun engaging urban foresters to help balance the approach and it is developing a case study about it.